

**P E R S O N A L**

# COMPUTER

*weekly*

**NEWS**

AUGUST 11 • 1984 • No 73

50p



**IBM HARD STORE**  
Megabytes of hard disk storage for the PC

**NEW ERA FOR APPLE**  
An in-depth look at the portable IIc

**GRAPHIC ACCOUNT**  
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**PLUS . . .**  
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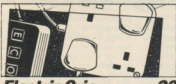
Something for everyone on PCN's buy and sell page — and this week you can put your ad in for free.

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# MENU

August 11 1984

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## PERSONAL COMPUTER WEEKLY NEWS



Cover illustration by Richard Dunn  
Scrabble is a registered trademark owned by JW Spear and Sons plc.

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The Amstrad CPC comes complete with a powerful version of Basic. Simon Williams has been learning the new dialect developed by Locomotive, and points out the main features and differences from BBC Basic.

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Variety rules — try a text-only Dungeons and Dragons adventure or a 3-D tank battle.

## PROGRAMS



### Spectrum 40

Mega the Millipede roams around the Spectrum screen in this version of the popular arcade game.



# Survey slams micro use

By Sandra Grandison

A large question mark has been placed against the usefulness of micros by a survey of parents, teachers and teenagers.

All are frustrated with their micros, and as a result parents are beginning to question more closely their purchases for their value in terms of career prospects and useful skills.

Gowling Marketing Services, based in Liverpool, carried out interviews in London, Durham, Lancashire, Cumbria, Merseyside and Birmingham. Sessions were split into groups of eight to ten people. There were four sessions with parents and 12 to 17-year-old

boys, one session with teachers and the 12 to 17-year-olds and five sessions with just the teenagers.

The general feeling of the groups was that they wanted to do something more active with their computers. Paul Stoddard of Gowling said: 'Software houses just haven't got the right people to produce something to give users more variables. As a result they are very limited by what they can do.'

Chris Curry of Acorn (issue 72) and Gary Kildall of Digital Research echo similar feelings about the directions micro should take.

Chris Curry said: 'It is time now to start showing where micros can perform tasks... they will only

become an essential part of the home if they do practical things.' On the same note Gary Kildall thought: '... the way to move ahead is to have a computer system which controls functions in the home.'

In the schools teachers look on micros as just hands-on experience and are looking for directions from their pupils and software houses. Parents seem to think that educational software isn't teaching children anything — all that is needed are yes/no responses.

'Children aren't learning or solving any problems,' said Mr Stoddard. 'Packages on the whole are bad value for money.'

This obviously defeats the object

and with a bit of thought and time software houses could come up with the goods. But time is money and spending months or perhaps years on developing educational software may be seen as a wasteful exercise.

Mr Stoddard commented: 'If software houses got together with schools, they could see their needs and learning could be extended to the home. At the moment teachers are left to their own devices and the result is often very poor.'

■ What do you think? Are micros going to be a passing fad? Do you feel let down by the standard of software? Write to us at PCN and let us know how it looks from your point of view.

## Beau Jolly rebottles games

Beau Jolly is to launch game-packs of Imagine software later this month.

The six-packs will be £19.99 and the range covers the Spectrum 48K, Commodore 64 and Vic 20. There will also be a four-game pack for the 16K Spectrum at £14.99 and a 'valuepack' for the BBC nearer Christmas.

The company bought Imagine's stock and the rights to market the games just before Imagine's chronic difficulties came to the surface. But Beau Jolly isn't simply offloading its stocks of ageing games — all the titles are hot from the duplicating studios. Most of the games are from Imagine and include such ex-chart material as Wacky Waiters, Bewitched and a new Imagine game, BC Bill.

Beau Jolly hasn't taken up Imagine's pet project, the fabled 'Megagames'. A spokesman said of these: 'There's nothing to see, it's all based on say-so and speculation — the games are in a very, very basic state'. But he added that Beau Jolly hopes to purchase the Imagine name from Imagine's liquidator.

The company is working on a number of new projects, including conversions of the classic Ah Diddums for the 64, Arcadia for the Dragon and Megavault for the Vic 20. It is also concluding negotiations with a top US software house. This concerns importing Commodore 64 material which may be ported across to the Spectrum and BBC, possibly by ex-Imagine programmers with whom Beau Jolly is keeping in contact.

## Cabel set to go off the air

By Kenn Garroch

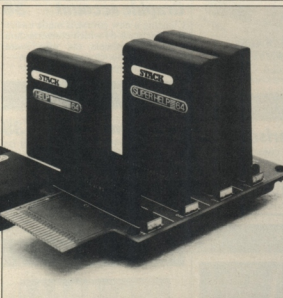
Cabel Electronics, the British computer monitor manufacturer, has been forced into liquidation. It went under on July 19 and although these are early days, there seems to be little chance of a rescue bid.

Owners of Cabel monitors are in the unfortunate position of losing Cabel's service system and their guarantees.

The monitors, based on a Mul-

lard design, were originally designed for educational use and were backed with a two-year parts and labour guarantee. Cabel also provided an after sales service, promising to repair any faults within three days.

Cabel had the distinction of purchasing all its parts from British manufacturers while keeping the price down and maintaining high quality.



**ROLLING STACK** — The Liverpoolian light-rifle manufacturer Stack Computer Services (051-933 3355) has added a new weapon to its armoury with a cassette-based compiler for the Stack 100 range. The compiler costs £14.95 and slots in at the foot of Stack's range of Commodore 64

programming tools, the rest of which have now come down in price — these cartridges cover extensions to Basic, fast tape units, and a two-pass assembler. They range in price from £25 upwards. The modules are available direct from Stack or through dealers.

# Ace maintains its strong suit

Some new life has been breathed into the Jupiter Ace to make it the cheapest micro you can buy.

Boldfield, the firm that bailed out the Ace, says the Forth machine at £29.90 is selling well and it doesn't expect stocks to last for much longer than three months.

Since the Cambridge-based company took over Jupiter Cantab's operations five months ago, it has covered a lot of ground and the latest promotion is not necessarily a

final fling for the Ace.

Boldfield has produced 11 new software packages and a number of add-ons. Titles for the 16K Ace include Atic Raid, Cygnus and Centipede at £7.82 each, Frogger, Alien Defender and Amazing Maze at £5.75 each and an Assembler/Disassembler, Chess and Spreadsheet at £9.89 each. For the 3K Ace there's Triple Pack and Puzzle/Bombs at £5.06 each.

Paul Downham of Boldfield said:

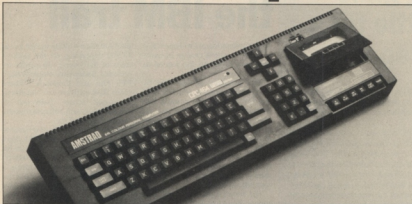
'We decided to take on the Jupiter Ace because there were so many users and no-one was supporting them. We give full customer support services and intend to do so even when the last machine is sold.'

Buying on a mail order basis, you can also get spares, books and components for the machine and take advantage of several special offers Boldfield (0487 840740) has put together. For instance, for £138 you can buy an Ace, a 16K RAM

pack, video connector and a Sanyo 12in monitor.

By September the company hopes to have several new products on sale which include: a disk drive controller for 5¼in disk drives, a colour card for both colour TV sets and RGB colour monitors, and interfaces for RS232 and Centronics-type printers. As for software there'll be a high-resolution Turtle Graphics package, a database, and a 65K all-text adventure.

# Amsoft hi-price



Amstrad — no shortage of software but confusion over prices.

By Bryan Skinner

Software for the new Amstrad CPC464 looks like being plentiful but expensive.

Amsoft, the software arm of the company, has set a price of £8.95 on the first batch of games released. This is some £3 more than the Spectrum equivalents—games like Codename Mat and Harrier Attack, and closer to the price of programs for the BBC.

A number of software houses including Micromega, Durell, Protek and Indescomp have deals with Amsoft; some titles are to be marketed exclusively by Amsoft, other are to be distributed jointly. This will put users in the peculiar situation of being able to buy games from Amsoft at £8.95, or from

retailers at £7.95. Amsoft also has an arrangement with Comet which is to stock the full range of Amsoft software.

However, membership of the Amstrad User Group will entitle you to a 15 per cent discount on software, bringing the price of games down to £7.60. This discount will only be applicable to software ordered directly from Amsoft. A year's subscription to the user group will cost £19.95 and members will receive six magazines a year, listing all available software for the Amstrad, as well as carrying news and features. The discount will also apply to hardware such as the Centronics printer cable, which should be available this week at £9.95.

Educational titles are ready, but are not yet with retailers because of distribution problems. These programs are to cost the same as games—a welcome change from current over-inflated educational software prices.

Certainly, the Amstrad won't lack for software. Hisoft's renowned Devpac will cost £19.95 and the company's Pascal will sell for £34.95. Kuma has released its Zen assembler for £19.95 and a Home Budgeting package for £9.95. Also available in the near future will be a word processing package and a set of Business Tutorial programs. Amsoft will produce a full guide to using CP/M 2.2 when the operating system and disk drives are released.

## IN BRIEF

### Dragon drags on...

Talks were continuing last week as the future of Dragon Data is slowly resolved.

Although Dragon now answers the telephone as Touchmaster nobody at the schizophrenic company or its erstwhile marketing arm at GEC is willing to comment on the state of negotiations. But the waiting should soon be over; the indications are that little remains to be done besides dotting the 'i's and crossing the 't's.

### ... but OCS sees light at end of tunnel

Oxford Computer Systems (OCS), which ceased trading earlier this summer (issue 68), now looks hopeful of getting back on course.

Divested of the Interpod module the software company sees light at the end of the tunnel. Officially there is no comment from OCS, but guarded optimism has returned to the company.

### Atari mystery

Reports that ex-Commodore UK marketing manager John Baxter would be taking charge at Atari UK in the wake of Jack Tramiel's takeover have been scouted by Atari.

Another ex-Commodore man, David Harris, is due to become managing director of the renamed Atari Corporation in the UK. Mr Harris was a sales and marketing executive with Commodore International. Until he arrives the UK company is being run by its finance director Simon Westbrook.

### QLs not bad for eyes

QL fever is in the air again but if CompuSer has anything to do with it, it won't damage your eyes.

CompuSer (0689 46116) has a QL-compatible monitor which, like the others in its range, is specially treated to reduce reflections on the screen. Its Toshiba CRT has darkened glass and a chemically etched and roughened surface.

The 14in medium-resolution monitor is likely to cost £325 and CompuSer can tailor the unit to match the sleek lines of the undoglegged QL.

### Corona fizzes

Midlectron, UK distributor of the IBM-compatible Corona, has improved the spec of the PC-22 and cut the price of the Corona PPC-XT portable.

The PC-22 desk-top system now gives you 256K with its twin floppies, monitor, keyboard and bundled software for £3,795. At the same time the hard disk portable version, the PPC-XT, has come down in price from £4,200 to £3,795. Midlectron is on 0332 40085.

**MUSHROOMING ELECTRON**—Add-ons are gradually appearing for the Acorn Electron. With this little device from Broadway Electronics (0234 56303) you can turn your micro into a low-cost business machine. At £29.95 the Sideways ROM Card enables you to tackle word processing, graphic design, spreadsheet and accounts programs with a touch of speed. With four-ROM capacity, it plugs into the Electron's expansion port which means software can be instant.



## Tandy bags brace of printers and cuts prices

If you're shopping around for a printer Tandy plans another two for its range.

For £229.95 you can pick up a thermal ribbon machine which handles almost any plain quality paper. Running at 50 cps the IBM-compatible printer hooks up to any micro with a Centronics interface.

The DMP 105 dot-matrix printer costs £169.95. Moving at 80 cps it

has the standard features associated with a printer of this kind. Both printers will be available in December.

Tandy has also slashed the price on some of its range of micros. The Model 4 with one disk drive costs £976 and with two drives £1,148. The 16K Colour Computer is now £119.95 with the extended version at £139.95. Tandy credits economies of scale with the price cuts.



Tandy Color Computer — price falls.

## VIEW FROM JAPAN



## Big guns battle for ad space

By Serge Powell

Sirius, the dog star, has emerged from his kennel and the dog days are upon us. In the present as in the past the dog days are a period of doldrums — in other words not much has been happening on the Japanese computer scene.

In a fit of desperation I've decided to take you on a tour of Japan's leading computer magazines, and the first stop on this Michelin Guide to publishing is one that bears the highly original title of Ascii (as in the ASCII of MSX notoriety). Ascii describes itself as 'a monthly magazine of computer science'. I was going to start off by telling you that it's about 380 pages thick and that the editorial covers this, that and the other. But I got a bad allocation table; I'm amazed, I'm astonished, my mind is boggled by what the Japanese public will accept from a magazine.

Ascii starts off confidently enough; it has a cover. The cover bears a picture, in the case of the latest issue a slightly bizarre picture of what appears to be a Lisa frozen in a block of ice. Phew, what a scorcher. I have no idea what it's about.

Turning the page, things seem more or less normal — NEC has taken the inside front cover and facing page for an advertisement of its PC. This is followed by a two-page index partially in English, so that I can tell you the magazine deals with such topics as OS9, CP/M, and the inevitable MSX Basic. There will also be the game of the month, some material on business applications, letters to the editor, pictures, programs, and presumably some advertising.

Some advertising? You'd better believe it. Or rather, you'd better use the index because if you intend to browse through this publication it could become a life's work. The next 106 pages are advertisements. Perhaps Ascii is monthly because nobody could possibly find the time for that much browsing every week.

The advertisers follow one another towards the editorial pages like race horses in the later stages of a long race, the favourites bunched at the front and the less fancied beasts strung out behind them. I found the going a bit hard. NEC, covering its bets, has several runners — four pages at the front advertising two different systems, followed by four for Sharp, followed by another four for NEC — one system and 16 different monitors.

Then the field is split; the Yamaha MSX entry, hotly pursued by a couple of Brother printers. National not making much ground with its 3in OEM disk drives, and then another group of heavyweights — two pages for Toshiba, four for Fujitsu, two for Sony, two for Seikosa, two for Hitachi, leading to yet another NEC advertising page. The field is brought up by no fewer than 11 consecutive pages of Ascii advertising, and if you've survived this far your reward is finally to encounter some editorial pages that won't be trying to sell you anything.

I won't say too much about the merits of advertising — some would say that it pays for the editorial, some that the quality of the editorial attracts the advertising. But let's look at it from another point of view. Most of these advertising pages are full colour. None of them gives the advertiser much change from £800. Ascii is one of a vast number of magazines — it may be that this country has more computer publications per head of population than any other country — and even in the slack summer months they have been doing very nicely, thank you.

The magazines are a measure of the competitive state of the Japanese micro business. This is underestimated abroad, where it is often assumed that the major manufacturers operate hand in glove under the watchful eye of MITI, the Japanese equivalent of the Information Technology arm of the Department of Industry.

They are also a measure of the resources that Japanese companies can bring to bear to sell their products. As I mentioned in an earlier column (issue 71), Toshiba and Sanyo are about to get serious about the computer market in the UK and Europe, and it could be that dog days will never be the same again once they, the advance guard, arrive.

# Osborne takes the IBM trail

The rejuvenation of Osborne UK is continuing with a change of name and an addition to the top of its product line.

The company is now run by Future Management, which bought out Osborne in this country but maintained its product line and the responsibility for its users. Mike Healy is still in charge, and he is now promoting the IBM-compatible Polo. There is also a replacement for the original Osborne 1 in the wind — a portable with greater disk storage and a larger screen, likely to cost just above £1,000.

The Polo's high degree of IBM compatibility has won enthusiastic reviews in the US. It is built by a US company substantially owned by Radofin, maker of the Aquarius.

The machine combines an 80188 and a Z80, and a 128K system with a printer, colour monitor, and bun-

dled software is likely to cost about £3,000 depending on the fluctuations of the pound. The software includes Supercalc, SuperWriter, PFS File and Crosstalk. Where other IBM software can't be directly ported across, Polo has an arrangement with Softeam to make the implementation.

Although it will be a new name to European users — those who don't drive Volkswagens — Polo is far from being a Johnny-come-lately. The company has been operating in the US for 20 years, and it has the kind of Silicon Valley address that still inspires awe. It also pays attention to such European considerations as ergonomics.

Future Management now lines up with the Executive luggable at about £1,000, the Encore portable in the £1,600 region, and the Polo desk-top system.

## Compass plugs in more Grids

Briefcase computer maker Grid has knocked down the price on its Compass range (issue 51).

You can now pick up the basic model for £4,134 and there's a 23 to 30 per cent reduction on models 1100, 1101 and 1109. Two new portables have also been added — the Compasses 1121 and 1129.

The 1121 comes with 256K of RAM, 384K of bubble memory and can hold up to 512K of ROM. The 1129 has the same features but 512K of RAM. Both models can give

increased performance at similar prices to the original Compass computers.

Grid has also extended its management tools software range to a total of eight at £902. In addition to word processor, spreadsheet, graphics, database and file packages, there's GridAccess, GridRecord/GridPlayback and GridTransfer.

GridAccess allows Compass computers to send and receive data to one another. GridRecord/GridPlayback records the keystrokes of routine tasks and allows their automatic playback at a single command. GridTransfer converts MSDOS data files to Grid-OS data files and vice versa.

Portable users wanting to communicate with mainframes and micros can now do so with Grid Server. The networking system allows up to 58 users of IBM PCs or Grid Compass computers to access data from any location. All Grid-Compass products are available from Thame Systems, Tel: 084 421 5471.



National Grid — the new 1121 model.

## Modems maker ready for off

The low-price acoustic modem announced by Protek Computing of Livingston could be in the shops by the end of this month.

Problems with supplies of the American-made chips hit the firm's plans. But now production should get going in the next week or so.

The modem will cost £59.95 and Spectrum users will have to pay an extra £24.95 for an interface, cables and software. For BBC micro

owners, software and cables costing £14.95 will be required.

Protek is planning a range of modems of the hard-wired variety and interest on the Continent has been particularly high, says Protek Computing's managing director Gordon Hewit.

As for the firm's hit program *Hunter Killer*, that's been converted for the Amstrad and should be in the shops now.

# IBM portable's bow

The IBM portable has arrived in the UK amid reports that US sales of the machine are not going well.

March this year saw the launch of the IBM portable PC in the US. Since then (and in some cases, before) a large number of IBM compatible portables have made an appearance here. Many of the compatibles cost less than the IBM machine, and Compaq in particular is said to be outselling it four to one.

The IBM portable (Pro-Tectard in issue 54) is a self-contained unit with a carrying handle, a 9in amber display, a single-sided disk drive which offers 360K of storage, and a clip-on IBM keyboard.

Weighing 30lb, the IBM falls into the lugable market rather than the portable; you wouldn't want to use this machine on your knee.

Its UK price is £1,704 for a 256K machine, expandable up to 512K. The keyboard is priced separately at £185.

There is no immediately apparent practical reason for pricing the keyboard independently, but it is possible that IBM has in mind variations in either style of connection or style of key. An IBM spokeswoman offered 'tradition' as an explanation of this unusual example of unbundling, but a packaged portable without a keyboard is going to look short of a selling point or two.



IBM's portable PC — a plodder in the US but now launched in the UK.

**PRISM ON CALL** — As though to prove Prism's intentions to branch out (issue 73), IBM PC, Sirius, Apple and BBC users can now buy viewdata communication systems. Ranging from £89.95 for the BBC to £259 for the IBM, each system contains a modem, an interface cable and viewdata software. Users can access Prestel, Micronet 800 and other viewdata services. But IBM and Sirius owners can also reformat downloaded viewdata pages for further processing and transfer files between IBM, Sirius and other computers. Commodore 64 and Apricot users will be able to buy similar packages by next month.



## Keyboard blitz

IBM plans to celebrate its PC's third birthday with a blitz on the range that sees the PCjr given a real keyboard.

The 'home' version of the PC has had its development retarded in the popular imagination by a keyboard which, although breaking new ground with its infra-red link, trod old ground with its keys. Now IBM will offer a typewriter-style keyboard, plus memory increases to take the PCjr closer to the original PC.

The jr has still to be released in the UK and IBM won't whet any appetites by saying when it might be available here. But the changes in its spec should mean that, if and when it turns up, it will be more complete than the system selling sluggishly in the US since its November launch. It will also be far less a home computer, but IBM's estimate of the average domestic income always did look more appropriate to the Bahamas than the Bradfords.

But IBM fever continues unabated in the US. The excitable tone was set by the build-up to the launch of the PCjr; now the same enthusiasm is evident as a super-PC boom on the horizon.

## SOFTWARE

The new releases

### Games

**Aquarius:** Radofin Electronics has passed the 50 mark in the list of games it offers for the star-crossed Aquarius. Most are for the 16K model, but there's also a fair selection for the 4K machine and a similar number in cartridge form.

**Commodore 64:** Interceptor Micro's Where's My Bones is now available from Micro Dealer UK (0727 34351) for £7 on cassette and £9 on disk.

### Holiday reading — Acorn's courses.



### Education

**Acorn:** School's out but Acornsoft has its eye on those poor souls facing re-takes and has launched four packages based on the O-level syllabus. Maths 1 and 2, English Language and Biology give you a revision course for £12.65 each and they are available for BBC and Electron systems.

### Business

**PCDOS:** From leafy Wimbledon Village comes news of a special offer from Micropro (01-879 1122); for £399 you can buy WordStar, Mailmerge, StarIndex, and the spelling checker CorrectStar. Contact Micropro's Mr Speller for details. For business people who don't think they're getting the best from their staff, Softsel (01-844 2040) has two packages from the US that should either buck them up or cause them to leave. Sales Edge and Management Edge aim to raise performance at £191 each. As forecast in issue 66, Fox and Geller (01-580 5816) has been quick off the mark with new versions of Quickcode, dUtil, and dGraph for the imminent dBase III. Quickcode is an applications

generator, dUtil a utility program, and dGraph a graphic output routine for dBase data. Volkswriter users thinking of upgrading to Volkswriter Deluxe have been dangled a carrot by Vaser (02040 5434), the UK distributor, which is offering an upgrade for £60, less than half the difference in the prices of the two versions; it has also set up its own telephone support unit.

**Apricot:** ACT Pulsar (021-454 8585) intends to offer Framework and dBase III on the Apricot range from next month. Both packages need at least 256K RAM.

**Commodors, Spectrum:** For the 64 and the 48K Spectrum Kemp (01-444 5499) has produced two new accounting packages. Purchase Ledger, for the 64, includes VAT accounting, but in these trying times its provision for 100 creditor accounts may be insufficient. It costs £27.95 in cassette version and £2 more on disk. Stock Control, for the Spectrum, can be used with either Microdrive or cassette and costs £19.95.

**Epson MX20:** The ever-active Kuma (07357 4335) has adapted its Deskmaster 2 word processing package to let Epson users pro-

cess words in conjunction with disk drives and an Oval 80-column interface. Deskmaster 2/VID costs £69.50 plus VAT.

### Systems/Utilities

**PCDOS:** You'll need IBM compatibility and a hard disk to run Filestream, an applications generator and command language from ALS (Developments) on 0923 773536. Designed for multiple file processing with a small vocabulary of English commands, the full system costs £569.25. Roundhill Computer Systems (0672 54675) has a program development tool of a different kind — its Plix86 is a multi-window debugger. It costs £170 and needs about 50K of free memory under PC DOS 2.0.

**Future:** BOS business operating software has been configured to run on the Future Computers range and is available through Encotel (01-686 9687).

**OS9:** Communications under the Unix-like OS9 are handled by a new product called SysCom(X) from Measurement Systems (0635 42677). The package operates with any 6809/OS9 machine equipped with either a 6850 serial or 6821 parallel interface.

# PCN CHARTS

# GAMES

NEW WEEKLY CHART! NEW WEEKLY CHART



		GAME TITLE	PUBLISHER	MACHINE	PRICE	
▲	1	2	Match Point	Psion	SP	£7.95
▲	2	25	Full Throttle	Micromega	SP	£6.95
▲	3	1	Sabre Wulf	Ultimate	SP	£9.95
▲	4	3	TLL	Vortex	SP	£5.95
▲	5	6	Beach-head	US Gold	C64	£9.95
▲	6	5	Lords of Midnight	Beyond	SP	£9.95
▲	7	10	Jet Set Willy	Software Projects	SP	£5.95
▲	8	7	Arabian Nights	Interceptor	C64	£7.00
▲	9	8	Mugsy	Melbourne	SP	£6.95
▲	10	14	Jack & Beanstalk	Thor	SP	£5.95
▲	11	4	Valhalla	Legend	SP, C64	£14.95
▲	12	12	Psytron	Beyond	SP	£7.95
▲	13	9	War of the Worlds	CRL	SP	£5.95
▲	14	13	Trashman	New Generation	SP, C64	£5.95
▲	15	11	Hulk	Adventure International	SP, C64, AC, AT	£9.95
▲	16	20	Cavelon	Ocean	SP, C64	£5.90
▲	17	17	Stop the Express	Psion	SP	£5.95
▲	18	30	Micro Olympics	Database	SP, C64, AC	£6.95
▲	19	18	Beaky & Egg Snatchers	Fantasy	SP	£6.50
▲	20	16	Fighter Pilot	Digital	SP	£7.95
▲	21	15	Loco	Alligata	C64	£7.95
▲	22	22	Encounter	Novagen	C64, AT	£8.95
▲	23	23	737 Flight Path	Anirog	Vic, C64	£7.00
▲	24	—	Blogger	Alligata	C64, AC	£7.95
▲	25	27	Kosmic Kanga	Micromania	SP	£5.95
▲	26	—	Code Name Mat	Micromega	SP	£6.95
▲	27	—	Aztec Challenge	Audiogenic	C64, AT	£8.95
▲	28	28	Son of Blogger	Alligata	C64	£7.95
▲	29	19	Frak!	Aardvark	AC	£7.50
▲	30	26	Football Manager	Addictive	SP, C64, AC	£6.95

# MICROS

Top Ten over £1,000

TW	LW	MACHINE	PRICE	DISTRIBUTOR
▶1	1	IBM PC	£2,390	IBM
▶2	2	Apricot	£1,760	ACT
▲3	7	Compaq	£1,960	Compaq
▲4	3	Apple III	£2,755	Apple
▶5	5	Televideo TS1603	£2,640	TH
▲6	8	Wang Professional	£3,076	Wang
▼7	4	Sirius	£2,525	ACT
▲8	—	Kaypro	£1,604	Kaypro
▶9	9	Philips P2000 c	£1,484	MD, KDS
▲10	—	NCR Decision Mate V	£1,984	NCR

Top Ten up to £1,000

TW	LW	MACHINE	PRICE	DISTRIBUTOR
▶1	1	Spectrum	£99	Sinclair
▶2	2	Commodore 64	£199	CBM
▲3	5	BBC B	£399	Acorn
▶4	4	Vic 20	£140	CBM
▼5	3	Electron	£199	Acorn
▲6	7	Memotech 500	£250	MTX
▲7	—	Amstrad	£229	Amstrad
▲8	9	Oric	£99	Oric
▼9	8	Atari 800XL	£250	Atari
▶10	10	Dragon	£150	Dragon

These charts are compiled from both independent and multiple sources across the nation. They reflect what's happening in high streets during the week up to **August 1**. The games chart is updated every week.

Neither mail order nor deposit-only orders are included in these listings. The prices quoted are for the no-frills models and include VAT.

Information for the top-selling micros is culled from retailers and dealers throughout the country and is updated every month.

PCN Charts are compiled exclusively for us by RAM/C, who can be contacted on 01-892 6596.



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*Caverns of Khafka	7.95	12.00
*Dallas Quest	—	12.00
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## Play the game with Microdrive

Now that Interface 1 and Microdrives have become available, wouldn't it be a good idea for software houses to issue instructions with their games to enable the user to transfer them onto Microdrive?

Alright, some may say that if the software houses did this it would increase piracy of tapes, because some unscrupulous people would then use that information to make copies of the tapes for their own personal gain.

But let's be brutally honest about this: you don't need to break into the program in order to make a copy of it.

All that is required for this are two cassette recorders and a 5-pit DIN plug lead. No matter how secure the program may be, it is that easy to make a copy and it would be naive of the software houses to think otherwise.

It is not simple, however, to transfer games onto Microdrive because information such as the start address and code length are required.

I am sure that there are a lot of people like myself who are not able to extract this information from the program.

Even if the software houses are not willing to publish this information, why can't the purchaser of the game be able to send it back to them, together with an additional fee, so that they can transfer it themselves?

### PCN £10 Star Letter



It is very frustrating to have your Microdrive sitting there inactive while having to load a game from tape which takes so long that you could go out and take the dog for a walk and come back to find it still loading.

That might be a small exaggeration, but I am sure that most people take my point.

G K Mallinson,  
Maesteg, Mid Glam.

## Registering a sound solution

Just a quick note about Simon Williams' article on intercept driver sound in the Beeb (issue 69).

It was an excellent article; however, the manual does state that the P, A, X and Y registers must be saved, not just the X-reg.

Wouldn't it have been easier in that case to use event 0 buffer event only?

Jon Abbott,  
Leeds.



Would you like to see your name in print?  
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## A perennial piracy problem

Try as I might, I could not resist writing to you on the perennial topic of software piracy and the industry's combat techniques.

I don't think I need say anything about the professional pirates, those businesses which make copies of other people's software and sell the copies for profit. What they do is no more nor less than criminal.

Back-up copying is understandable where the software is essential to running a business and where any time that the software is inoperable, it is going to cost. But even in this case back-up copying should only be done with the agreement of the software house.

Much has been made of late of the idea that if software were cheaper (around £2.00 has been mentioned), piracy would no longer be a problem. The reasoning behind this it's-so-cheap-it's-not-worthwhile-copying argument is that people copy the software because they can't afford to buy the originals, but I feel this is not quite true. People copy software because they don't want to pay for it, not because they can't.

For instance, computer magazines cost a small fraction of most software, yet many people would still borrow a friend's rather than buy their own. This would suggest piracy will remain as extensive as it is now no matter how much the software industry drop their prices, unless of course they start giving it away.

Despite what I say, I too feel that a lot of currently available software is too expensive, but of course like any other buyer/seller situation, the seller will try to sell at the best price the buyer is willing to pay. So if we want cheaper software we must refuse to pay the currently asked price; this does not mean, however, that we go out and copy the software (for 'copy' read 'steal'). Home

computers and their software are luxuries: if we can't afford them, we must do without.

Finally, a brief thought about the dongle method of protection. Dongles cost money to make, so the software companies admit they will add to the cost. But, wait a minute, in the past the same companies have defended the high cost of software by the fact that they have to cover themselves against the revenue lost due to piracy.

Surely if the dongle is effective (and what use is it if it's not?) then won't piracy be drastically reduced, increasing the effective revenue (and profit) and hence covering the cost of manufacture of the dongle?  
C Hamilton,  
Belfast.

## Doing vital PR for the Oric

I read with great surprise the letter (issue 69) suggesting that PCN was in some way biased against the Oric.

In common with the author I have had absolutely no problems with my Oric and have never had a single loading failure with any tape on any speed. I too can live with the ROM bugs.

Where I differ from the writer is that PCN is the only magazine I buy because of its frequent articles regarding the Oric. I have a full ring-binder providing a wealth of information on all aspects of the machine. Microwares furnishes useful utilities virtually every week.

Although my machine is trouble-free I sympathise greatly with those less fortunate. The criticism must surely be levelled (and often is) at the company, not the computer — in particular, its PR department. Their attitude seems to do little to promote their own good products.

As a subscriber to *Which?* magazine, I was also recently amazed to find absolutely no reference to the Oric computer among an extensive review of some 17 machines, including the Laser 200, Aquarius and

Colour Genie. This may well reflect the company's inability to communicate and promote its products.

I hope that PCN will continue its interest in the Oric and fill an obvious gap in the literature.

Dave Cornwell,  
Laindon, Essex.

## Sir Clive must put his house in order

Dennis Long's overscanning problem with his QL (issue 70) can only be cured by Sinclair. I find it impossible to program the QL if F1 (for monitor) is pressed at start-up, since the first three characters of a program are invisibly off the command window, which will not take a border. Pressing F2 (for television) and then keying Mode 4 is a temporary solution, though there is then no separate window for listing and running the program.

Brian McCann (issue 70) is also right to raise an eyebrow at Sir Clive's claim in PCN that 'We will provide unbeatable quality and back-up service'. It is not unbeatable yet.

I joined QLUB on taking delivery of the QL, when I found that Archive was a sound knowledge of SuperBasic. To my surprise, I was told that membership would take 28 days to deliver. What is there to deliver? A full 29 days passed after I received the post card confirming this 'order', and still no membership number. I phoned again. Don't worry, the girl said, my name was on her VDU.

The most devastating indictment of Sinclair's policy came from Sir Clive's own lips in a TV interview on *Dateline*. He freely acknowledged that QL customers had been used to finding bugs in the system, which he then claimed to have sorted out. I did not pay £400 to test a prototype QL, or to proofread a Beginner's Guide that has up to a half a dozen misprints per page.

Sinclair complains that bad tempered letters such as this may damage the QL's prospects abroad. The machine has remarkable capabilities for its price and, therefore, he suggests, deserves our patience with its testing troubles.

As a contented ex-Spectrum user I would have lined up behind him loyally had my expectations been prepared for my experience. Until we can rely on his words, he cannot expect us to moderate ours.

Patrick Doory,  
London SW12.

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## Basic essentials of the perfect micro

**Q** Despite having had a Dragon 32 and a Commodore 64 I am still searching for my perfect micro. This must have good graphics and sound, easily understood Basic for the apprentice programmer and a decent amount of peripherals and software.

Eventually I narrowed my list to the Elan, Yamaha YIS503 and the new Amstrad CPC464, but I'm still in doubt about the extent of imported software/peripherals for the Yamaha, the Elan's Basic and the Amstrad's Basic.

**Could you tell me which of the three most fits my needs, and what the release dates are for the Elan and the Yamaha.**

*Paul Edwards, Camberwell, London.*

**A** Last things first. The greybeards among us will remember the catch phrase 'a new Elan will be launched on September 14' — to do the company justice, it didn't define 'launch' and it didn't specify the year, but punters assumed it would be 1983.

So far we haven't seen the Elan alias Flan alias Enterprise, so we can't comment on it. What we can say is that, in the time since it was first mooted, the biggest Christmas micro boom Britain has ever seen has come and gone, and if anybody's been waiting for it to arrive since last September they'll have missed a lot of programming fun. Sure, there's a chance it will turn out to be a world-beater, but there's also a chance that every IBM PC in the world will spontaneously start to grow long red hairs.

We assume your interest in the Yamaha stems from its ability to take a music keyboard. If you're determined to use your micro as a musical instrument as well as for programming then the Yamaha might well be for you, but if you just want a micro with good sound you might well do better elsewhere.

The Yamaha's MSX Basic is easy to understand and nice to use, the standard MSX sound specification will give you all the sound facilities you're liable to need. The pricing of MSX machines, however, is liable to be a little higher than comparable machines currently on the market. As far as software is concerned, the Japanese stuff we've seen is good, but the main thrust is liable to be from UK companies. As they've got a good deal of Z80 experience there should be quite a lot of good stuff around.

The Amstrad seems quite a bargain from what we've seen so far. The Basic is excellent, and its facilities are impressive for its price. Software is starting to come out for it right now.

But when all's said and done, what's wrong with your 64? It has good sound, lots of software available, and while the peripherals aren't exactly state-of-the-art it has plenty of them. The only problem is the Basic, so why not just buy one of the extended Basics that are available, such as Turbo Basic or BC Basic? Currently you seem to be looking at machines in the price range that your current machine is in, and with respect we'd say that was daft.

## PEEK at Spectrum's murky manual

**Q** I've just about got to grips with Basic programming on my Spectrum, but I find chapter 24 (on the memory) and chapter 25 (on system variables) puzzling. I'd like to get to grips with machine code programming, but if I can't grasp the subject from the manual, wouldn't it just be wasting my money?

*Tim Brown, London SW3.*

**A** You're not alone in being confused by that section of the manual. The problem here is at least partially that Sinclair has tried to cram a quart into a pint pot, so although there's a good deal of useful information there, it's not that easy to understand.

One of the easiest ways to work out what's going on inside the Spectrum's ROM is to take a look at the system variables. Try this:

10 FOR N=23552 TO 23558

20 PRINT N,PEEK N

30 NEXT N

40 POKE 23692,255: GO TO 10

What you're doing here is PEEKING at the number in the memory locations from 23552 to 23558, and presenting the result in tabular form. The POKE 23692,255 is just a way of telling the Spectrum that it has another 255 lines to scroll before it asks you, 'scroll?'

Your program should now be looping round the screen, so press a few keys and you'll see some of the PEEK values change, because the area you're PEEKING is the one that deals with key presses.

Now look at chapter 25 and you'll see that the area from 23552 is 'used in reading the keyboard'. It'd be pointless going into the matter in more depth at this stage, as you really need to find out more before you get yourself involved with specific system variables. But with a bit of luck you may just have felt something click into place.

Now if you look at the memory map in chapter 24, you'll see that the Spectrum's memory locations are laid out in order. Each of these locations can hold a number from 0-255, and whenever you tell the Spectrum anything, it changes the numbers in some of those locations.

## What's holding up the MSX machines

**Q** I have a ZX81, and last Christmas I decided to wait until the MSX machines had arrived before deciding on which machine I should upgrade to. At the time I thought it would be a matter of a few months, but it's beginning to look like it'll be Christmas again before I see one, and I'm not even sure about the specifications yet.

**For example, what do you do about peripherals, and what are the peripherals like? Please help, as all this waiting is stunting my growth.**

*Di Smart, St Ives, Cornwall.*

**A** Be assured that the MSX machines should be in the shops this autumn, but don't be

too assured, because the Japanese companies seem to be having grave difficulties getting the UK versions into the country.

The delays were initially blamed on the dock strike, but it may actually be more the case that some companies are having difficulty getting together the volume production they need. At least one company we know is expecting to receive small quantities of hand-built machines fairly soon, so the mass production ones clearly can't be ready.

The MSX companies have a couple of problems that do not affect UK manufacturers. First of all, they've done a sort of simultaneous launch deal with one another, so they have to wait for the slowest. It'll also be difficult for them to be too flexible on price without acting in concert, and for the same reason they've had to be cagey on specifications.

Their Japanese origin also doesn't help, as you can't really fly in large quantities on consumer goods, so they have to come by sea. This means the companies have to get their Christmas stocks dead right.

The Japanese element is also going to cause problems because the pound's gone down, and the manufacturers will therefore get fewer Yen for every machine sold. As there are already doubts that they'll be able to match the pricing of the 64, and the guess for prices is around £250-£300, they're liable to be squeezed on margins.

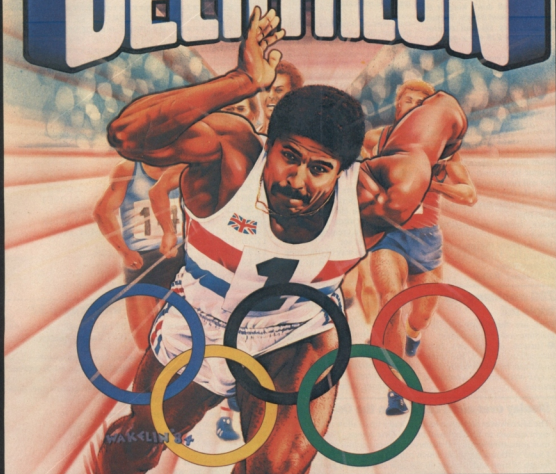
As regards peripherals, there is a story that MSXDOS went down well when it was shown in the US, but there's hardly been a sniff of them here, and very few details are available. The way that standard peripherals will be used is by running them out of the cartridge slot. This is not a misprint — it may seem odd, but as the machines have non-standard edge connectors, it's the only standard expansion slot that's available.

Having said all that, the machines we've seen (Japanese market only) are pleasant to use, despite having some very odd Japanese styling quirks. If you can bear to wait a few more weeks, do so, but keep an eye open for what the rest of the market is doing.

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**Microwaves, PCN, 62 Oxford Street, London W1A 2HG.**

## Spectrum copyright hint shared

Anyone wishing to add a copyright message to their Spectrum programs will be interested to know how to make a line which cannot be altered or deleted, but will run normally.

To do this just enter the line you wish to protect as line 1, and then type:

```
POKE (PEEK 23635+256*PEEK 23636)+1,0
```

This protects the program by making line 1 into line 0.

Michael Batey,  
 Birkenhead, Wirral

## Z80 machine code triple bill

Here are three tips for Z80 machine code programmers.

● Instead of the two byte instruction LD A, 0, the same result can be achieved by XOR A, (AF hex), and this is one byte shorter.

## Display over eight colours on the Oric

The Microwaves section in issue 62 had a tip to allow more than eight colours to be displayed on the Oric screen. The routine took some time to run and displayed only one colour at a time, so I have written a program which runs in a comparatively short length of time and displays all the new colours in a grid on the screen.

Paul Enns,  
 Tonbridge, Kent

```
8 HIRE$
1 FOR G=1 TO 7
2 CURSET G*38-1,0,1 : DRAW 8,199,1
3 CURSET 8,G*25-1,1 : DRAW 239,0,1
4 NEXT G
18 FOR Y=8 TO 7
28 FOR X=8 TO 7
38 CURSET X*38,Y*25,3
48 FOR C=8 TO 11
58 FILL 1,1,X*16 : FILL 1,1,Y*16
68 NEXT C,X,Y
78 END
```

● A little used instruction CPL, (2F hex), like the first tip, has the advantage over the more commonly seen XOR 255 of being only one byte long. This reverses each bit in the 'A' register (eg 10101010 becomes 01010101).

● The following routine will allow a program using CALLS or JPS to be relocatable.

```
CALL RET; call any RET in ROM
DEC SP; decrease stack
DEC SP; pointer twice
POP HL; HL=address of DEC SP
```

This works because a CALL puts the address of the next instruction on the stack. For example: CALL 0070 could be the first line on a Spectrum.

Callum Gibson,  
 Blairgowrie, Perthshire

## Give your Amstrad a change of character

Amstrad owners will no doubt have been experimenting with user-definable characters with the Symbol after command, and may have created a whole new character set.

One simple way of obtaining a new character set is to type CALL &BADA.

This provides an interesting effect by splitting each character down the middle and further rearranging it.

If you wish to reset the computer from within a program, put CALL 0 where required, and a complete hard reset will occur.

James Eibisch,  
 Cheltenham, Glos.

## Using Easyscript and 1520 plotter

You can use the Commodore 1520 plotter with Easyscript, and without all the OPEN statements, using this program.

When run, the program asks for the number of columns to be used, and sets the plotter to lower case mode and loads Easyscript.

To obtain a hard copy, the printer option should be 0 and the following sequence of keys should be pressed:  
 'f1,0,D,0,6 return,P'.

```
1000 REM *****
1010 REM *** EASY SCRIPT SET UP ***
1020 REM *** BY MATTHEW DESMOND ***
1030 REM *** USE WITH 1520 PLOTTER ***
1040 REM *****
1050 REM *** WHEN COPY IS NEEDED ***
1060 REM *** TYPE F1,0,D,6 (RET) ,P ***
1070 REM *****
1080 PRINT "s:"
1090 PRINT "HOW MANY COLS ?Q"
1100 PRINT "1) 80"
1110 PRINT "2) 40"
1120 PRINT "3) 20"
1130 PRINT "4) 10"
1140 GETA$: IFA$="" THEN 1140
1150 A=VAL(A$)
1160 IFA(10RA)4THEN 1140
1170 OPEN3,6,3:PRINT#3,A-1:CLOSE3
1180 OPEN1,8,15:PRINT#1,"I":CLOSE1
1190 OPEN6,6,6:PRINT#6,1:CLOSE6
1200 PRINT "INSERT EASY SCRIPT DISK"
1210 PRINT "PRESS A KEY WHEN DONE"
1220 POKE198,0
1230 GETA$: IFA$="" THEN 1230
1240 CLR:LOAD"0:X",.8,1
```

Matthew Desmond,  
 Chelmsford, Essex

## Graphics and text on TV with Dragon 32

Further to a Microwave in issue 54 on a possible method of getting text and graphics visible on the TV at the same time, here is an improved version.

Type in the following routine, save it on cassette and then RUN it. You can type in graphics commands in direct mode and see them being carried out.

The program includes a check sum to ensure the data statements are entered correctly.

```
1 REM MIXED TEXT AND GRAHICS
2 REM DRAGON 32
3 REM BY F R ELLAHI 1984
5 CLEAR 408,32708
6 PMODE4: PCLS
18 L=32781:C=8
28 FOR T=8 TO 64
38 READ A$: V=VAL("&H" + A$)
48 POKE L+T,V : C=C+V
58 NEXT T
68 IF C<>8494 THEN PRINT"YOU HAVE MADE A
TYPING ERROR IN THE DATA STATEMENTS":STOP
78 POKE 361,8 : POKE 269,127 : POKE 278,189
88 DATA 73,81,69,7F,81,68,86,81
98 DATA 69,26,23,86,F7,13,B7,FF
108 DATA 22,B7,FF,C3,B7,FF,C5,B7
118 DATA FF,C7,8E,84,88,A6,84,84
128 DATA BF,A7,88,8C,86,88,26,F5
138 DATA 4F,1F,81,7E,9D,3D,86,87
148 DATA 13,B7,FF,22,B7,FF,C2,B7
158 DATA FF,C4,B7,FF,C6,4F,7E,9D
168 DATA 3D
```

F R Ellahi,  
 Halifax, W. Yorks.

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Two of the current crop of titles which may interest the Apple user.



'Exploring Applesoft' by Roger McShane, published by Prentice Hall at £13.45 (paperback 170pp).

It seems a truism that computer books which claim to 'explore' or 'reveal' something, seldom seem to take the reader beyond the garden next door.

That said, there are merits even in guidebooks to nearby locales, which is perhaps the most accurate description of *Exploring Applesoft*. It doesn't exactly explore Applesoft,

since none of its quirks are examined, nor any of the techniques for simulating absent features.

What this book does, and does well, is to place the various keywords into context, demonstrating typical uses both in real programs and as small exercises or hints in an alphabetical listing of each keyword. Its strongest feature, however, is the idea of collecting these little bits together and keeping them in text-files.

Selecting from a list (another module) and EXECING these lines into the machine (yet another) provides a neat and very effective library function which could cut programming time considerably, if the reader is attentive and follows the leads that have been given early in the text.

It's a pity more isn't made of this point, even so, because a lazy or inattentive reader doesn't get constant reminders at later stages in the text.

Even so, a readable and well-presented manual, which brings the rarified theorising of the Applesoft manual into some kind of focus. **RK**



'Apple II Needs You' by Frank Wattenberg, published by Prentice Hall at £14.35 (paperback, 336 pages).

Your Apple II may not, in fact need you, despite this book's title, but that's one of its few oversights. It's organised into 30 projects which range from pretty complex to fairly trivial, but even the less impressive ones can be used as sub-sections of the more advanced material.

I particularly liked Wattenberg's careful balance between light and heavy. In one section,

for example, he develops some handy calculus routines and then applies them to a lunar-lander game to upgrade the Acceleration and Gravity functions.

Another major project is a mini text-editor, which makes the Enigma-type encryption-decryption routine described later into a very complete coding system. Actually, this editor is not so mini, and being well structured and clearly explained, would be quite easy to extend. Even adding a global search-and-replace wouldn't be impossible.

An interesting decision, and one on which I have mixed opinions, was to gather the program texts themselves into a separate appendix, referring in the chapters to the line numbers when discussing a particular point. This has the benefit of not interrupting the reader's flow with slabs of printout and ensures that crucial lines of code aren't broken at misleading points, but it does involve a lot of page-flipping.

Overall, however, a useful and informative guide to writing quality programs. **RK**

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The QL is bringing a breath of fresh air to user groups, as Harriet Arnold found out.

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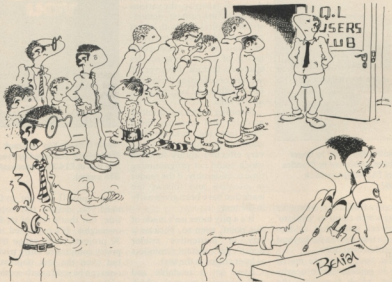
The QL has been selected by a TRS-80 group as the tonic to revive its flagging fortunes. Sinclair's business micro is particularly suited to the group said chairman Dick Mackie since the machines have certain features in common: the Tandy Model 1 and QL are 'both very basic systems, cheap to start off with so that, as with the Model 1, add-ons will be the most important thing'.

Mr Mackie seems to welcome the QL's bad points along with the good.

The BBC was the rival contender but the Edinburgh-based group decided that moving into fresh fields demanded something brand new.

They went for something so utterly new that no QL had felt their fingertips when they incorporated the two extra initials into the group's name, but one member has now received a dongle-free QL which has been passed around.

Details from Dick Mackie, Edinburgh 031-447 6651.



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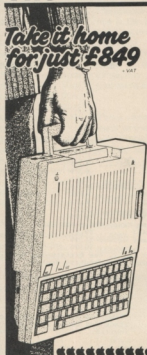
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PCN 3

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Simon Williams has been on the track of Locomotive Basic, a new version for the Amstrad.

# Basic comparison

The new Amstrad CPC 464 64K colour computer has received considerable coverage in the press (see *PCN* issue 66 for review) and has been generally greeted with approval for putting together a lot of the best features of other micros. But in addition the operating system and resident Basic offer many features previously unavailable to the programmer working in a high level language.

The Basic included with the Amstrad was written by a firm called Locomotive, and has much in common with BBC Basic. It's therefore worth comparing the two. There are three main sections of the language that are interesting.

## Structures

One criticism that has been levelled against

Locomotive Basic is that it hasn't followed the lead that Acorn set and Sinclair followed on the QL in providing proper control structures. These are seen as a way to exclude the infamous GOTO statement. But the main area in which Locomotive Basic falls down is in the omission of multi-line procedures or functions with the facility to pass local variables.

Single line functions are allowed, and these are reminiscent of functions offered in some of the really early versions of Microsoft Basic.

There is also no REPEAT...UNTIL loop structure, but instead the WHILE...WEND loop is included. This is rather more useful than the REPEAT...UNTIL as the test for executing the loop is performed at the start of the loop. With a REPEAT...UNTIL, the

loop must be executed at least once.

This may seem rather an esoteric distinction, but Listings 1 and 2 may serve to illustrate the difference. Listing 2 is the Locomotive version.

The IF...THEN...ELSE statement is fully supported, which means that the whole structure can be nested. In BBC Basic:

```
20 IF A = 1 THEN IF B = 1 THEN IF C = 1 THEN
PRINT "ALL=1" ELSE PRINT "A AND B=1"
ELSE PRINT "A=1"
```

will evaluate incorrectly if A<>1 or B<>1 because the ELSE statement will always refer to the first IF clause in the statement. Locomotive Basic has no trouble in sorting these things out.

There are several useful features of Locomotive Basic which will make life

### Listing 1

BBC REPEAT...UNTIL example. T% can be either positive or negative

```
20 MODE 4
30 FOR N%=1 TO 10
40 X%=RND(1279)
50 T%=RND(1000)-500
60 IF T%<0 GOTO 120
70 Y%=0
80 REPEAT
90 MOVE X%,Y%:DRAW X%+64,Y%
100 Y%=Y%+4
110 UNTIL Y%>T%
120 NEXT
```

### Listing 2

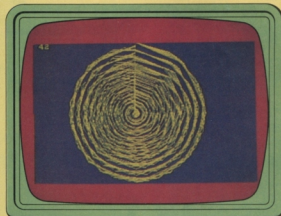
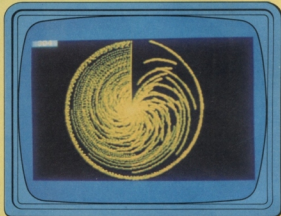
WHILE...WEND does the same on the Amstrad

```
20 MODE 1
30 FOR N%=1 TO 10
40 X%=RND*640
50 T%=RND*800-400
60 Y%=0
70 WHILE T%>0 AND Y%<T%
80 MOVE X%,Y%:DRAW X%+32,Y%
90 Y%=Y%+2
100 WEND
110 NEXT
```

### Listing 3

BBC color demo

```
20 MODE 2
30 FOR N%=0 TO 15
40 VDU 26
50 COLOUR 128+N%:CLS
60 VDU 28,3,24,16,8
70 COLOUR 143-N%:CLS
80 A=GET
90 NEXT
```



easier for the programmer. Several of these facilities have had to be provided by extra 'toolkit' programs on the Beeb. Of particular note are `FRE` which will return the amount of free space left in memory (and may be used to force 'garbage collection'), `CONT` which will continue execution of a program after it has been temporarily halted, and `RENUM` which can be used to renumber a whole program or, more importantly, only a section of it.

`CHAIN MERGE` may be used to combine two or more programs together from tape. This is a useful feature if you want to keep a set of standard subroutines for use in your programs. Integer and string variables may either be defined by appending a % or \$ to the variable name, or by defining groups of variables using the `DEFINT` or `DEFSTR` statements. These commands hark back to

older versions of Basic, such as that used on the TRS-80, so it is surprising that Acorn didn't consider them important enough to include on the BBC.

Locomotive has also added several commands new to Basic. The `ERASE` command will release space used by an array if it is no longer required in the program, `LOWER$` and `UPPER$` will convert strings of mixed characters to either lower or upper case, and `MAX` and `MIN` will return the maximum or minimum values from a list of numbers or numeric variables. Any key on the keyboard may be redefined using the `KEY DEF` statement and the escape key may be easily trapped using the `ON BREAK GOSUB` construction.

There are a few features of BBC Basic which are not available or are more awkward to use on the Amstrad. Among

these are the lack of a `GET` statement (although `INKEY$` is supported), the `TAB` function which may only take the horizontal coordinate and prints the appropriate number of spaces on the screen, and the fussiness of the interpreter in requiring spaces between each keyword and variable.

## Graphics

When it comes to graphics commands, Locomotive Basic seems to have been modelled more closely on Spectrum lines than on Acorn's rather complex way of doing things. Simple functions such as setting foreground, background and border colours are achieved using `PEN`, `PAPER` and `BORDER` commands rather than a number of parameters within a `GCOL` statement. The swapping of colours within

20 ▶

### Listing 4

```

10 REM The Amstrad equivalent of the demo in listing 3
20 MODE 0
30 FOR N%=0 TO 15
40 WINDOW 1,20,1,25
50 PAPER N%:CLS
60 WINDOW 4,17,8,18
70 PAPER 15-N%:CLS
80 IF INKEY$="" GOTO 80
90 NEXT
    
```

### Listing 5

```

10 REM Keeping the sound queue fed on the BBC micro. Try making
line 70 just PROCsound to see why the ADVAL statement is necessary.
20 MODE 2
30 REPEAT
40 FOR Y%=0 TO 1023 STEP 8
50 GCOLOR,Y%/8
60 MOVE0,Y%:DRAW1279,Y%
70 IF ADVAL(-6)>0 PROCsound
80 NEXT
90 CLS
100 UNTIL FALSE
110 DEF PROCsound
120 READ F%
130 IF F%=0 RESTORE:ENDPROC
140 SOUND1,-15,F%,20
150 ENDPROC
160 DATA 53,61,69,73,81,89,97,101,0
    
```

### Listing 6

```

10 REM An equivalent program on the Amstrad CPC 464
20 MODE 0
30 WHILE -1
40 FOR Y%=0 TO 400 STEP 4
50 MOVE 0,Y%:DRAW 640,Y%,(Y%/4)MOD 16
60 ON SQ(1) GOSUB 100
70 NEXT
80 CLS
90 WEND
100 READ F%
110 IF F%=0 THEN RESTORE:RETURN
120 SOUND 1,F%,100,7
130 RETURN
140 DATA 478,426,379,358,319,284,253,239,0
    
```

the palette (there are 27 available on the Amstrad, with a maximum of 16 selectable at any one time) is effected by the `INK` command. Any two colours may be made to flash alternatively as one colour and the flashing rate is selected with `SPEED INK`.

All in all, colour control is a lot more human under Locomotive Basic. Listings 3 and 4 give a comparison of the colour commands on the two machines.

The number of plotting options on the Amstrad isn't as large as on the Beeb, and a notable omission is any form of fill routine. The smaller number of options does allow each to be covered by a separate command, however. Thus `MOVE`, `PLOT` and `DRAW` govern absolute movement while `MOVER`, `PLOTR` and `DRAWR` do the same for relative plotting. The colour of the drawn line can be specified as a third parameter in the `DRAW` command.

The graphics and text cursors may be tied together with the `TAG` command and separated again using `TAGOFF`, and the ink colour at a specified point is obtained using `TEST X,Y`. The current positions of the text and graphics cursors are returned by the `HPOS`, `VPOS` and `XPOS`, `YPOS` commands respectively.

The BBC micro was quite revolutionary in providing separate text and graphics 'windows' which could be defined separ-

ately and allowed text and graphics to be freely mixed on the same screen. The Amstrad extends this ability by providing up to eight text windows plus a single graphics one. These are defined with the `WINDOW` command and text may be written to any window using `WINDOW SWAP`. User defined characters may be set up using the `SYMBOL` keyword, after having first defined how many UDC's are to be used with the `SYMBOL AFTER` command.

## Sound

One of the key features of Locomotive Basic is its ability to handle Z80 processor interrupts directly. What this means is that you can write programs that appear to execute simultaneously as each will take a share of the processors time at the machine code level. One of the uses of this feature with a home micro might be the running of music routines in the background to a games program. The Basic commands which handle this feature are `AFTER` and `EVERY`, which will service a subroutine either once or continuously at a predefined frequency.

If you don't want to run to the complications of using interrupt-driven routines, however, Locomotive Basic can still help to service a sound subroutine with the `ON SO` clause. This construction

will check one of the three sound channels and jump to a subroutine if there is space in the sound queue for that channel to add extra notes. Listings 5 and 6 demonstrate how to use this feature, and the BBC equivalent using the `ADVVAL` statement.

The three sound channels simulate a stereo effect by running into different parts of the stereo image, but the sound statement itself is fairly complex and needs considerable study to get the best from it. The sounds may be modified by either or both of two envelopes, governing tone and volume. This is virtually equivalent to splitting the `ENVELOPE` command on the BBC micro in two. It is perhaps a little easier to understand because of this.

## Conclusion

The authors of Locomotive Basic have gone out of their way to cater for as many different users of the Amstrad machine as possible. The first time user should find that the number of specific commands with sensible names make the machine easy to use. Those graduating from other machines will notice very little is missing from this implementation of Basic (except the use of procedures and some other structured constructs) and will be pleased with the extra facilities designed to make life easy for the programmer. PCN

## Locomotive that stops and starts

The most unusual feature of Locomotive Basic is its ability to handle interrupts directly from Basic. The command `EVERY` gives access to four interrupt timers, allowing a program to jump to a subroutine at a set interval. This may sound amazing, but it's difficult to think of any real use for it. However, what it does do is change the way you design your programs.

The example program shows three bouncing balls, each driven by the interrupts. Lines 50 to 70 set up the interrupts, line 50 sets the program to jump to the subroutine after 4 counts (of 1/50 second each) on timer 0. The bouncing balls are shown by the digits 0, 1 and 2, to show which timer is being used.

The interrupts must be handled carefully. Note that each subroutine to move the characters begins with the command `DI`, disable interrupts, and ends with `EI`, enable interrupts. This has to be done because an `EVERY`, set to a given timer at a faster rate than another, may interrupt another inter-

rupt-driven routine (if you see what I mean).

When an interrupt occurs, whatever is happening at the time is 'suspended'. So if you use one command that is dependent on another, eg `LOCATE C,R:PRINT B$;`, you may find that the interrupt occurs between the two statements. In this example, if the next statement jumped to by the interrupt is a `PRINT`, you'll find things appearing in odd places on the screen.

Another factor you have to take into account is that if you set all the timers to interrupt at fast rates, say every 1/50 sec, then only one will get a look in. Similarly, if the subroutine set for a given timer takes a long time (and uses `DI`), then any other `EVERY` command may never get executed.

You could write the sample program in 'normal' Basic, by jumping to the subroutine in sequence, but the interrupts provide an easy and simple solution. They also give you a good grounding in how interrupts work, without having to get your

hands dirty messing around in machine code.

The BBC also has the ability to handle interrupts, but not from Basic. On the BBC they are known as events and to use them you must redirect vectors and make use of the built-in assembler. This is much harder to do but is probably more useful.

The only real use for interrupts is for scanning keyboards, ports, etc or moving sprites round the screen. But such processes are better handled with machine code routines because of their superior speed.

Locomotive Basic, as implemented on the Amstrad, is probably easier to learn and use than BBC Basic. Things like setting `INK`, `PAPER` and `BORDER` colours and so on are all accessed from Basic words rather than the BBC's obscure `VOU` and `FX` commands. However, some of its unusual features, while they may encourage you to take a more structured approach to programming, may be of limited practical value but lots of fun.

### Program using Basic interrupts

```

10 CLS
20 X0=10:Y0=10:X1=X0:Y1=Y0:X2=X0:Y2=Y0
30 DY0=1:DY0=1:DX1=-1:DY1=1:DX2=1:DY2=-1
40 B0$="0":B1$="1":B2$="2"
50 EVERY 4,0 GOSUB 90
60 EVERY 3,2 GOSUB 150
70 EVERY 5,3 GOSUB 210
80 GOTO 90
90 DI:LOCATE X0,Y0:PRINT " "
100 X0=X0+DX0:Y0=Y0+DY0
110 IF X0>39 OR X0<2 THEN DY0=-DY0
120 IF Y0>22 OR Y0<2 THEN DY0=-DY0
130 LOCATE X0,Y0:PRINT B0$
140 EI:RETURN
150 DI:LOCATE X1,Y1:PRINT " "
160 X1=X1+DX1:Y1=Y1+DY1
170 IF Y1>39 OR X1<2 THEN DX1=-DX1
180 IF Y1>22 OR Y1<2 THEN DY1=-DY1
190 LOCATE X1,Y1:PRINT B1$
200 EI:RETURN
210 DI:LOCATE X2,Y2:PRINT " "
220 X2=X2+DX2:Y2=Y2+DY2
230 IF X2>39 OR X2<2 THEN DX2=-DX2
240 IF Y2>22 OR Y2<2 THEN DY2=-DY2
250 LOCATE X2,Y2:PRINT B2$
260 EI:RETURN

```

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Public utilities' aficionados will be pleased to learn the program is valid for the new rates brought in from April 1984, and also allows for the phasing out of the old peak meter (lines 130-190). The program does however rely on your giving fairly accurate estimates of your use of all your domestic appliances.

How it runs

The program consists of two main sections (data entry, where you input details of your use of electrical appliances, and the printing of the bill and table of use on the screen). The program is self-explanatory, and KEYS are added to explain its workings. Important variables are shown in tables.

The data screen, lines 10000-10220, gives data for most household appliances. You could change most of these appliances if they are not used, but loop counts may be adjusted if you add more data.

# Electric Oric

Table 1: important variables

G	General Tariff Unit rate (all money is expressed in pounds)	S%	Number of people in household
E1	Economy daytime rate (0730-0030)	M	Type of meter (1=General, 2=Economy 7)
E2	Economy 7 night rate (0030-0730)	K	KW rating of heating appliances
Q1	General Tariff quarterly standing charge	P1	Proportion of use at night for Economy 7 users
Q3	Economy 7 quarterly standing charge	P2	Proportion of use in day for Economy 7 users
Q,R	Standing charge and unit rate used depending on meter stated	B	Number of bar heaters used
AS()	Appliance names	S	Number of months in current quarter falling in start/end of the heating season
P()	Quarterly cost of appliance on General Tariff meter	F	Number of months falling in the middle of the heating season
A()	Quarterly cost of appliance on Economy 7 meter	H,H1,H2	Hours used on General Tariff and night hours used on Economy 7
T	Total cost of all appliances on General Tariff meter	D,D1,D2	Number of times used per week on General Tariff, in day and night on Economy 7
A	Total cost of all appliances on Economy 7 meter		

PROGRAM LISTING

```

0 PAPER=1:INQ:POKE18,11:G040
10 REM # ELECTRIC ESTIMATE #
20 REM # BY A.J. NEWHAM #
30 REM #
40 REM # TITLE PAGE #
50 CLS
60 PRINT$(PC228)
70 PRINT$(PC22888) ELECTRIC ESTIMATE #####
80 PRINT$(PC192)
90 PRINT$(PC228) ANY KEY TO START '1
100 GET K:CLS
110 REM # INITIALISATION #
120 DIM A$(100),P$(100) #A$=MFL,MM$E #E=COST/30
130 DIM AC$(8) #ALTERNATIVE PRICE TO E#
130 Q1=7.28 #GENERAL TARIFF Q.CHARGE#
140 Q2=0.843 #UNIT CHARGE Q3#
150 Q2=0.18 #ECONOMY 7 Q. CHARGE#
160 E1=.8058 #DAYTIME UNIT RATE#
170 E2=.0134 #NIGHTIME RATE#
180 DEFNWA$(IN$(INQ+2))=3:280
210 PRINT$(PC228) meter of installation of meters "
220 PRINT$(PC228) you have '1:PRINT
225 PRINT$(PC228) if you want to use whether you would "
230 PRINT$(PC228) you changed your meter choose "
235 PRINT$(PC228) and enter what rated day and night "
240 PRINT$(PC228) use of each appliance. #PRINT:PRINT
250 PRINT$(PC228) Type 1 for - General T, meter only "
255 PRINT$(PC228) 2 for - Economy 7 meter "
260 GET K:#MFL$(MFL)
270 IF MFL OR P2 THEN PRINT$(PC228) PLEASE #GOTO200
280 IF MFL THEN GOTO100
290 IF P2 THEN GOTO100
300 REM # GENERAL APPLIANCE INPUT #
325 CLS:PRINT
330 PRINT$(PC228) B, Night refers to the cheap rate "
340 PRINT$(PC228) and is from 0030 to 0730. "
350 PRINT$(PC228)
360 PRINT$(PC228) what is the name of your family '1#
370 CLS
380 PRINT$(PC228) Enter information on your general "
395 PRINT$(PC228) appliances. "
405 PRINT$(PC228) how many 2 or more of any one "
415 PRINT$(PC228) appliance take the number of hours "
445 PRINT$(PC228) used together. "
450 PRINT$(PC228) NAME OF APPLIANCE '1#B1:51
460 PRINT$(PC228) HOW USED PER WEEK '1#
470 FORN=1TO30:PRINT$(PC228) NEXT N
480 IF MFL THEN 370
505 PRINT$(PC228) 7 USERS '1#2
510 PRINT$(PC228) HOW NIGHT '1#PRINT
520 FOR M=1TO 7:PRINT$(AC$(M),K
530 PRINT$(PC228)POKE18,1+7:PRINT$(PC228)1,28
540 IF MFL THEN INPUT$(MID$(18,1))
550 INPUT$(M)POKE18,1+7:PRINT$(PC228)1,34:INPUT$(M
560 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
570 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
580 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
590 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
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610 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
620 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
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750 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
760 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
770 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
780 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
790 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
800 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
810 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
820 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
830 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
840 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
850 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
860 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
870 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
880 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
890 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
900 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
910 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
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980 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
990 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1000 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1010 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1020 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
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1070 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1080 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1090 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1100 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1110 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1120 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1130 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1140 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
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1180 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1190 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1200 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1210 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
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1300 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
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1390 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1400 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1410 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
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1480 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1490 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1500 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1510 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
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1580 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1590 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1600 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1610 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1620 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
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1680 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1690 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1700 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1710 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1720 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1730 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1740 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
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1760 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1770 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1780 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1790 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1800 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1810 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1820 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1830 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1840 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1850 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1860 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1870 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1880 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1890 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1900 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1910 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1920 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1930 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1940 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1950 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1960 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1970 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1980 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
1990 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M
2000 PRINT$(PC228)1+7:PRINT$(PC228)1,34:INPUT$(M

```



A. Forrest

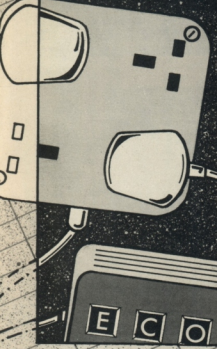
Hints on conversion

TEXT  
PING  
POKE616,Y:PRINT  
POKE617,X:PRINT "X,Y: OF PRINT  
GRAB  
PAPER:INK2  
IF..THEN GOTO  
?ASBSC3

Selects the text screen of 38 x 27 resolution normally  
The only sound command used  
Replace or omit Works like PRINT AT  
TAB(N)  
X,Y: OF PRINT TAB(X,Y): commands  
Grabs high-resolution memory area to give more  
Black background, green text used throughout  
The GOTO can be omitted on the Oric.  
You may have to add it  
Oric allows omission of semi-colons.  
Again, add if necessary

DEFNFR(N) One-line function. Replace with a subroutine, eg line 2021 N=func(x):GOSUB r=func(x):return:P(X)=N. Use same algorithm Not standard on the Oric  
If you have INKEYS do this — eg 7000 IF K5="" THEN K5=INKEYS:GOTO7000  
Replace with PRINT @ type command loop count can be omitted on Oric.  
Add if necessary Clears the screen Prints N spaces  
Instructions may have to be split up  
Takes numerical value of K5 and puts it into M  
Quotes may have to be added

TAB(N)  
GET K5  
FLOTX,Y,STR\$(N)  
FOR..NEXT  
CLS  
PRINT SP\$(N)  
DIM  
M=VAL(K5)  
DATA strings



```

1391 GET #16:FORM#(C)I:PRINT
1395 IF F#<0 THEN 1401
1399 CLS
1400 PRINT"Only 3 months in a quarter! Try again."
1406 GOTO 1390
1410 PRINT"SUICED AIR CENT. HEATING?"
1402 CLS:PRINT
1403 PRINT"Do you have "AN403": (Y/N)?"
1404 GOSUB 7000
1405 IF #=0 THEN 1500
1406 PRINT"what is the hvac requirement for?"
1407 PRINT"your house/flat is for storage house?"
1408 INPUT K
1410 IF #=1 THEN 1430
1420 GOSUB 8000
1450 AC(3)=(C$400)+(F#424)INKR(P1#E2)+(P1-1)E1
1460 P(3)=(C$400)+(F#424)INKR#H#
1500 AN403="RIGHT STORAGE HEATERS"
1405 IF #=1 THEN 1500
1510 PRINT"Do you have any "AN403": (Y/N)?"
1520 GOSUB 7000
1525 IF #=0 THEN 1500
1540 INPUT"how many but heaters do you use "J
1545 GOSUB 8000
1570 AN403="GROSS#F204)INKR(P1#E2)+(P1-1)E1E3
1580 INPUT"how many but heaters do you use "J
1605 IF #=0 THEN 1500
1610 FOR #=1 TO 40#
1615 AN403="BNE HEATER"STR$(K-40)
1620 PRINT"SU HEATING OF NO. "K-40": BNE HEATER "J
1630 INPUT #I:GOSUB 8000
1600 NEXT
1640 REM # OTHER APPLIANCES #
1700 CLS:PRINT
1710 PRINT"any other appliances (Y/N)?"
1720 IF #=0 THEN 2000
1730 INPUT"Name of appliance "AN(K)
1740 PRINT"Su Rating "K
1760 GOSUB 6000
1770 IF #=0 THEN 2000
1780 PRINT"any more (Y/N)?"
1785 GOSUB 7000
1790 IF #=0 THEN 2000
1800 REM # PRINT OUT BILL #
2005 P$=R(1,10) "URNS OF CURSOR
2000 TAB #0#
2010 PRINT"PRINT THE NEXT BILL WILL BE..."
2020 FOR J=1 TO 40#
2021 P(K)=AN(K)+(K)+(K)+ENR(K)E1
2022 AN#AN(K)+T#P(K)
2023 NEXT J:PRINT"AN#AN(K)
2024 PRINT"PRINT QUARTERLY CHANGE = "J
2035 IF #=2 THEN LHM
    
```

```

2030 IF #=1 THEN U#
2040 PRINT"TOTAL UNIT CHANGE = "J
2050 GOSUB 5000
2060 PRINT"TOTAL BILL"(SP$(3)) "L#J
2070 PRINT$(P(20))
2080 PRINT"you 7 for a list of the Quarterly
2090 PRINT"of most appliances."
2100 GOSUB 7000(=I)
2110 IF #="M" THEN 3000
2120 FOR L=1 TO 5:CLS:PRINT"APPLIANCE NAME"
2130 PRINT$(C$)I:GOTO 2000
2132 FOR T=1 TO 22
2134 IF #=2 THEN P#(K) ELSE P#(C)
2140 P(L)=T,AN(K)P(L)T#I,STR$(P(K))
2142 IF AN(K)="" THEN 3000
2143 NEXT Y:PRINT
2150 P(L)=26,"NEXT PAGE Y - PRESS ANY KEY"
2160 GET #4:NEXT L
2000 IF #=1 THEN 4000
3001 PLOT,1,26,"PLEASE USE Y# OR M#"GOTO3000
3020 REM # COMPARE ECU/GENERAL BILL #
3035 CLS:IF #=0 THEN 3000
3100 PRINT"PRINT"you will save #"(F#(F#-#+2))
3110 PRINT"if you converted to an Economy meter"
3120 GOTO 3700
3200 PRINT"PRINT"you will save #"(F#(405-(F#3))
3210 PRINT"if you converted to a Special Far if"
3230 PRINT" Meter."
3250 PRINT"alternatively try using bar"
3260 PRINT"right electricity, e.g. Tumble Dry"
3280 PRINT"at 2#."
3300 PRINT"Turn the Automatic Washes Machine on"
3310 PRINT"for a wash at night."
3320 PRINT"Have showers & baths at 8#."
3330 PRINT"Turn your timer on the immersion"
3340 PRINT"to finish at 7.30am."
3010 PRINT"Re-run this program with estimates off"
3020 PRINT"the shops you can make and if it is"
3030 PRINT"shower can you to contract the"
3040 PRINT"baths", contact the Electricity"
3050 PRINT"it is supposed to be free."
3300 PRINT"PRESS ANY KEY FOR A COMPARISON OF ECU"
3260 PRINT"GENERAL INEFFI CHANGES FOR YOUR"
3700 GET #4
3710 #=(L-1) TO 5:CLS
3720 PRINT"APPLIANCE"SP$(1)E3"ECU"SP$(5)E1"
3730 GOSUB 5000
3740 FOR T=2 TO 22:P(L)=T,AN(K)P(L)T#I,STR$(AN(K))
    
```

```

3745 IF AN(K)="" THEN 3700
3750 PLOT,1,1,STR$(P(K))\#(K)I:NEXT
3760 PLOT,1,26,"PRESS ANY KEY FOR THE NEXT PAGE"
3770 GET #4:CLS:NEXT
3780 PLOT,1,24,"TOTALS" PLOT24,24,STR$(K)
3790 PLOT,1,24,STR$(I)
4000 PLOT,1,26,"PRESS ANY KEY TO FINISH"GET#4
4010 CLS:PRINT$(C$)I:END"THE PROGRAM IS IN END"
4040 REM # PRINTS A LINE #
4010 FOR J=1 TO 20:PRINT" ":NEXT J
4020 RETURN
0000 REM # ASKS FOR DAY/NIGHT HRS. USE
0005 IF #=1 THEN 0020
0010 INPUT"Number of hours on in day"(H)
0020 INPUT"Number of hours on at night"(N)
0030 AC(1)=H+N:CLS:IF H#N THEN 0040
0040 P(K)=(H+N)E1:H+N:GOTO3000
0050 INPUT"Number of hours on each day"(M)
0060 P(K)=M*8#M
0070 REM # TESTS FOR Y/N ANSWER #
7000 GET#4
7010 IF #=0 THEN 7020
7020 PRINT#4:RETURN
8000 REM # ASKS QUESTION FOR EP USERS
8010 PRINT"how many hours 10 use from 0000"
8020 PRINT"0230 in each day?"
8030 GET #16:IF #<0 THEN 8020
8040 PRINT#16:#24:RETURN
10000 REM # GENERAL APPL. HOLDS DATA
10010 REM ITEM #
10018 DAT#APPL#CENTRE#F#E1E1E3
10020 DAT#ACCESS#F#RECORD#PLAYERS.#42
10030 DAT#BLACK & WHITE T.U., 111,COLOUR T.U.,107
10040 DAT#W/ TRAY, 807,VIDEO, 11,COMPUTER, 80
10050 DAT#IRON, 5,EXTRACTOR F#R#.#42
10060 DAT#CLOCKER HODGE, 1,ANGLUR GLASSER, 5
10070 DAT#ONE RAIL, 25,SMITZ RACIO, 91
10080 DAT#FURNITURE DRYER, 2,SMART CHAMBER, 93
10090 DAT#POWER DRILL, 25,HAIR DRYER, 33
10004 REM GENERAL APPL. TYPES USED
10005 REM ITEM # COST PER USE #
10100 DAT#CLOCKER DRILL, 802,515#SHOWER, 28
10110 DAT#ANDBLANKET, 1007
10120 DAT#CLOCKERLANE, 825,SHOWER, 835
10130 REM GENERAL APPL. TIME SECTION
10140 REM ITEM # COST PER BURNER #
10150 DATA F#D RITER, 1,WELDER, 10
10160 DATA SPIN ARM, 2,9,FRIDGE, 91
10170 DATA TONNER, 2,WASTE DISPOSER, 2
10180 DATA HOOR ROLLERS, 1
10190 REM HOVS FOR LIGHTS SECTION
10200 DATA KITCHEN LIGHTS, 6,3# BEDROOM, BEDROOMS
10210 DATA BATHROOM, HALLS, GARAGE
10220 DATA EXTERIOR LIGHTS
    
```

# Apple IIc

## PCN PRO-TEST HARDWARE

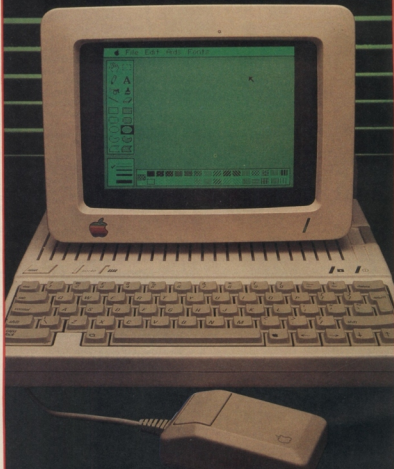
**A**pple Computer, the bastion of micro traditionalism, has finally jumped on the bandwagon and gone portable. The IIc is probably the final stage in the development of the Apple II series, but it also represents a major rethink in Apple policy.

Although the keyboard will be very familiar to anyone who has used the IIe, that is where the similarity ends. Everything on the IIc is inside the box and sealed off — no slots for add-on boards and therefore no pop-off lid. This is an Apple for people who want an off-the-shelf micro, not wire merchants. The expandability of the rest of the II series is gone. In its place is a set of specialised chips which provide a fixed, but quite flexible, set of I/O facilities.

### Presentation

Being aimed at a much less technically-minded buyer, the image of the Apple has undergone a subtle revamp. Externally, it's much more 'eighties', and put next to a 'full-sized' Apple, makes the latter look rather old-fashioned. In keeping with modern thinking, many of the specialised details, such as connectors, are identified

The IIc represents a break with tradition, says Apple aficionado Richard King. But he still wants one . . .



with icons which are intended to eliminate linguistic confusion.

In fact, the noticeable thing about the IIc is the relative unobtrusiveness of the actual technology, which is carried over to the documentation.

### Documentation

One of Apple's main selling-points has always been the quality of the documentation, which has ensured that interested owners could, if they so wished, not only understand every facet of the machine, but expand its capacities and even fix it if it broke.

This attitude to the user has changed completely. The manuals, with names like 'Apple Presents the Apple IIc — An Interactive Owner's Guide', are aimed at people who don't want to know how the

computer operates, just how they can make it work for them. The emphasis is on fun, and to enhance the enjoyment the manuals are super glossy with plenty of smiling faces in glorious technicolour.

Don't get me wrong, the manuals are still very good and cover all the necessary areas in detail. In particular, they are clearly written with a pleasant style.

### Getting started

Setting it up takes about three minutes from getting in the door. All the cables have plugs on and you simply can't go wrong. Should you have any doubts at all, 'Setting up your Apple IIc' is virtually a fool-proof Noddy's guide.

The job of instructing inexperienced users is handled by the machine, rather than more books, and each of the six disks



# START

## PCN PRO-T HARDWARE

which accompany the IIc have some training sections. Any inexperienced purchaser should be able to achieve a satisfactory fluency without support — a major accomplishment by Apple.

### Construction

Packed . . . tight — that's how it's constructed. Not surprising, when you consider that it has most of a well expanded Apple IIe inside it, as well as a disk drive.

You aren't supposed to look inside, so don't, but I can tell you from having seen one in pieces at its launch that the main board has a row of 16 6164 RAM-chips on one edge, for 2 x 64K, a squad of big fat 40-pin packages with custom VLSI chips inside, and not a lot else. Directly above the board is the half-height disk drive and the keyboard, and the various connectors

stick out of the back.

Each I/O port is different, so you can't do anything silly like sticking 240V into the joystick port. I was particularly impressed with the quality of the sockets, which are firmly and safely connected by captive bolts.

One thing which didn't impress me at all was the discovery that all Apple IIcs produce an American NTSC TV-signal (Never Twice Same Colour) which has the notable feature of not producing any colour whatsoever on anything but US standard TVs and monitors. You get a Modulator to convert it for PAL instead. This is a silly little box that plugs in the back, interferes with the handle and gives a monochrome picture.

You'll have to wait until August for the colour modulator, but it will be supplied at

no extra cost.

Having a handle on a computer doesn't necessarily mean that it's robust enough to carry around, even if it's light enough, but this one stood up very well to the rigours of frequent transportation.

The keyboard is always a major aspect of any computer, even those with mice, and though the keyboard initially resembles the IIe's it has an unfamiliar clicky action. This is strongly reminiscent of the Big Blue Machine, but it's not unpleasant. Apple makes much of the keyboard being full-sized, unlike many other portables.

Just above the keyboard are a series of diagonal slants. The two on the left are switches which select 80/40 column display and keyboard-layout. They're set deeply so they don't get flipped accidentally. A long fingernail will do it, but not easily. The right-hand pair of slants are indicator-lights for disk drive activity and power on — red and green respectively. Reset is on the top-left side, and requires the simultaneous depression of the Control key to work, as usual.

Part of the reason for the compactness of the IIc is because Apple left out the Power Supply, providing it instead as a remark-

## PCN PRO-TEST HARDWARE

ably solid little lump, with some impressively-long cables, which sits on the floor somewhere between the machine and the plug. It makes sure you can't ignore it by buzzing penetratingly — no amount of thumping it seemed to discourage it.

### Features

In terms that an established Apple user can relate to, the IIe contains one complete 64K Apple II plus the circuitry to provide the functions of two Super Serial cards, an expanded (with 64K) 80-column card, a Mouse card and a disk drive controller. Not to mention a disk drive to give the controller something to do. None of these, except of course the disk drive, exist as individuals; in fact, most of the functions are handled by the platoon of custom VLSI chips.

The relative wealth of features provided is fairly obvious from the array of sockets and connectors on the back panel, which provide the input and output paths. The changes here are that the Apple IIe only supports two games paddles, not four, and there's no tape I/O at all. You may say that no-one ever uses the tape nowadays, but having, on odd occasions, found myself with a blown DOS and the only data set in memory, I've used tape as a last resort.

Though there are no actual slots as such in the IIe, the organisation of all Apple II series machines demands that everything which isn't plain memory must reside in a fixed place in the address-map, which lies between \$C000 and \$CFFF. Additionally, this is subdivided into eight pages of hardware locations, which in an Apple II, II+ or IIe are the actual slots, and a common block of eight pages which is used for ROM drivers. This means that only one driver can be active at once.

The result is that each of the main I/O facilities of the IIe is associated with a slot number for the purposes of control. Slot 1

is occupied by one of the super serial interfaces, which in this case is used for the printer. Apple has recently decided that printers are serial, a point which I would argue. Serial I/O can be a very useful technique, but when applied to printers it becomes a positive liability. It's slow, and printers are slow enough in all conscience. The consequences of a dropped or spurious bit can be catastrophic, resulting in pages of gibberish. Parallel printers, on the other hand, would just garble the letter leaving the rest unharmed.

It's a shame Apple didn't think of putting a 6522 VIA in, allowing for both parallel and serial I/O and more besides. Slot 2 is another super serial, this time for communications (modems and stuff).

These two ACIA-driven ports come up with default configurations of 9600 baud, eight data, no parity and two stop bits for no. 1 and 300 baud, seven data, no parity and one stop bit for no. 2. These settings have been chosen so that serial port 1 is configured for an Apple Imagewriter printer, and serial port 2 for an Apple Modem, but they can be changed to whatever is appropriate for your device.

The simplest way is to use the Universal Utilities Disk provided with the machine to set a new PIN (Peripheral Identification Number). The PIN is in fact a code which represents the values required to operate a device correctly, but if necessary you can store new values in the 'screen-holes', which are small unused areas at the sides of the text page 1 screen area, and re-initialise the port.

Slot 3 is the 80-column display with extended memory as on the Apple IIe, but it is subtly different in that the I/O ROM area from \$C800 to \$CFFF is always mapped to slot 3. This is because there aren't any other slots, so no other ROMs.

Another difference which isn't immediately obvious is that the character set available when the firmware is active has been changed, mostly to support Slot 4 which is the mouse interface. The alterations have been in the area from ASCII 64 to 95, which are no longer inverse upper case but a set of icons for using a mouse in Text mode.

Apple proposes to make heavy use of mice in future, but to always use high-resolution graphics screens to provide suitable pointers and so on would prove too restrictive. The solution is the new character generator, which will also be available to IIe owners. Whether II and II+ owners will also get upgrades is another question.

Slot 6 is the disk interface, and slot 7 only exists as a way of being able to boot from an external disk drive under ProDOS. Slot 5 just vanished, and any reference to it will give a 'No device connected' error under ProDOS, and bounce you straight back again under DOS.

The total absence of slots and lack of an externally accessible bus means that



## PCN PRO-TEST HARDWARE

there's no expandability in the IIc — no fancy synthesizers, bit-pads, graphics cards, A/D and D/A cards or custom interfaces. And no subsidiary/slave/parallel processors either, which means no Accelerators and, in particular, no Z80s.

### Compatibility

Apple claims that the IIc is able to run most software written for other II series models. True enough, but the same claim was made for the IIe, and the whole truth was that most significant programs had to be modified before they'd work at all reliably. All but the most trivial needed some modification if they were to make effective use of the new machine.

The same applies here. You can get the original Integer Basic Star Trek to run on a IIc, but it doesn't use a tenth of the machine. The same program written in 65C02 machine-code using the extended RAM and double high-resolution with disk

based overlays would be a different thing entirely.

The newer programs, being written with Apple's Human Interface Guidelines in mind, have more uniformity and are thus quicker to learn and easier to remember at a later date. This is particularly important in view of the market at which the IIc is aimed. Most of the older programs and virtually all CP/M software doesn't fit with Apple's newly adopted philosophy.

This philosophy is enunciated in the Human Interface Guidelines, which Apple proposes should form a major part of the

design brief for all programs. It's also exemplified by the (relatively few) ProDOS programs currently available, which consist of MousePaint, Apple Works and the various ProDOS utilities. The important thing about these is that they have common details, such as how the editing works for user-input and where messages go, how menus work and so on. This should greatly reduce the likelihood of operator errors.

For example: when requesting input the back-arrow can be either destructive, actually deleting the letters as it moves, or non-destructive, in which case it simply moves the cursor backwards. Taking the cursor back to the middle of the input and over-typing will change the letter under the cursor, and pressing Return will accept the whole entry, no matter where the cursor is. It won't chop off the end, which may sound wrong but which makes more sense to the non-expert user. Additionally, with a non-destructive back-arrow Control-I will insert a space under the cursor and Control-R will remove the letter under the cursor, pulling the end of the line left to compensate.

Any other keypress will be accepted if it's a valid character, but if not the machine will give a small 'beep' but nothing unexpected will happen.

There's more to it than that, though. The Window Manager will extend the system to include windows very much like those on Lisa and Macintosh, though it'll never have the same power simply because the 6502, even extended, can't possibly match a 68000.

However, taken together, ProDOS and the rest of the system software which is promised will make considerably better use of an 8-bit processor than is common, and programs which call these routines and are written with due attention to the Guidelines will be a great improvement over most current software.

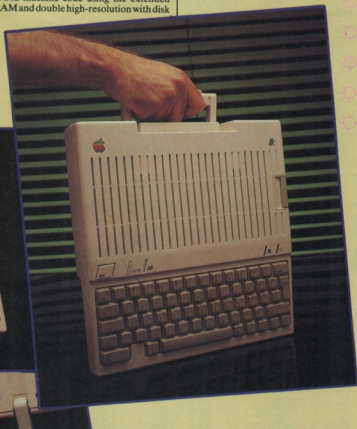
In other words, pre-Apple IIe software will run, mostly, and much of the Apple IIe software will run properly. But neither will make any use of the mouse and any programs which store inverse upper case directly into memory have a good chance of producing displays with interesting but illegible sequences of icons. The Apple IIc (and enhanced Apple IIe's) deserve, and will eventually get, specially-written software for which it will be well worth the wait.

### Verdict

Compared with the rest of the market, the Apple IIc is a good buy. It may not be as cheap as some, but it is a complete system, with all the bits needed, in one convenient box. Like a disk drive with some reasonable speed. It doesn't try to blind with technicalities, and though it bears scant resemblance to Wozniak's original, it's still a respectable and useful machine with a solid lineage.

I want one, even if it's only to use as a note-book cum calculator cum filer cum typewriter which is its main purpose and one which it would perform well for a good many years to come.

PCN



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# DRAGON CONTACT

This Dragon RS232 interface impressed Hywel Francis.

## PCN PRO-TEST PERIPHERALS

The RS232 input/output interface from Steve's Electronics is an expansion system that allows the Dragon to communicate with any device which also supports a serial port, eg modems, other computers, EPROM programmers etc. In addition, the unit comes complete with a 40-way connector that allows direct access to a built-in 6522 VIA (Versatile Interface Adaptor) chip. A set of additional Basic commands is also included that gives full control over both of these devices.

### Installation

The interface plugs into the Dragon's cartridge port. When the machine is switched back on, a prompt appears below the normal copyright notice to let you know you have access to the 13 extra Basic commands. With those the RS232 and the user port can be programmed easily without the usual PEKING and POKING about in the Dragon's memory.

The unit is hardware compatible with the Tandy CoCo (6809E), but not with its software due to the different ROM structures of the two machines. However, PEKING and POKING on the CoCo should allow the benefits of this device to be available to Tandy owners as well.

### In use

The RS232 section of the interface was tested by hooking it up to a BBC micro via the serial port. This connection was made easier to handle with the aid of the DIL switch pack, which eliminated hours of soldering since the various lines could be cross-connected. The connection on the I/O port for RS232 is the standard 25 way D connector.

Once the physical connections had been made, it was only a two minute job to

program the Dragon and the BBC to enable them to transfer information. First the baud rate was set for both machines (in the test I used the highest speed of 19,200 baud) and then both machines were placed into terminal mode. With the BBC this involved a series of FX commands, on the Dragon simply using the TERM command did the job.



The IDC and RS232 ports are at right angles.

I soon discovered that the SSAVE and SLOAD commands can be used to download whole programs across the link. This means two Dragons can be in touch via modems and the telephone network giving full and easy communication.

The method used to transfer the binary data down the RS232 is the Intel Intellect Translation Format. This format is an industry standard and has a data control structure that includes the load addresses with each data block. It also has the ability to have a number of arbitrary length data blocks within one file, and as there are no dedicated control codes, all characters are viewable as standard ASCII characters.

The IDC (Interplacement connector) on the top of the unit brings out 40 signals which are split into 2 groups: the 6522 I/O lines and the 6809E system bus. This I/O section is the main difference between a straight RS232 interface and this unit. It will interface the Dragon to any

user defined circuits using the very versatile 6522 VIA chip. A complete set of commands has been added to the Basic interpreter to make the best use of the VIA.

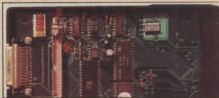
### Documentation

The documentation supplied with the review model was excellent. It assumes no prior knowledge and was easy to follow. It contains sample circuits and programs to start you on your way when connecting the Dragon to the outside world.

However, the manual was not included in the price of the I/O box — it costs an extra £4.50. If you wish to get the most out of this unit then the manual and a copy of the 6522 data sheet are a must. It is a pity that the latter was not included in the manual.

### Verdict

RS232 interfaces are not new for the Dragon 32 but in this case, considering the capabilities of the I/O section, it could almost be said that you are getting the RS232 as an extra. It's a shame that the manual does not include the full data on the 6522, but then you can't have everything.



An inside view shows the large 6522 VIA chip.

If you have an interest in interfacing your Dragon to the outside world then this device is a very good buy indeed.

PCN

**Product** RS232 I/O Interface **Price** £54.50 **System** Dragon 32 **Supplier** Steve's Electronics Castle Arcade, Cardiff, Tel: 0222-41905

Figure 1: additional commands

Baud n	sets the speed of data transmission where n is between 50 and 19,200.
INBYTE	reads the RS232 or VIA chip and returns one byte.
INPORT	reads in the current 8 bit value from VIA port A or B.
OUTPORT	configures the VIA port to output.
RS232ON	echoes characters from the keyboard down the RS232 link.
RS232OFF	terminates RS232ON.
SLOAD	downloads a Basic program from another Dragon via the RS232.
SSAVE	sends a Basic program down the RS232 to another Dragon.
SLOADM	downloads binary data from either another computer or an EPROM programmer.
SSAVEM	transmits binary data.
SPO A\$	dispatches the specified string down the RS232 link.
TERM	turns the Dragon into a terminal.
VIA	allows any of the VIA registers to be written to.

Figure 2: Intellect format

```

:BCAAAATTD000000000000000000000000CC
:BCAAAATTD000000000000000000000000CC
:BCAAAATTC

```

Explanation of symbols:

**I** is the start character for each block.

**BC** is the number of bytes within one data record.

**AAA** is the start address for the first byte of the particular data record and is always 0000 for the sign-off record.

**TT** designates the start and end records — TT=01 is the start record, TT=00 is the end record.

**B** is the actual data that is being transferred.

**CC** is the checksum and always equals 255 (FF hex) in the sign-off record.

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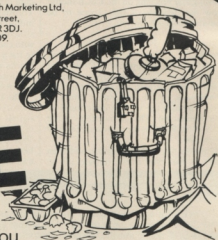
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# STORAGE SCALE-UP

The new heavyweight Alpha 10 hard disk system for the IBM PC is weighed up by John Lettice.

**O**n a flimsier desk it would be a bit like yachting. There you are, bashing away on the PC, when two hulking great blokes lug in this sheet steel coffin and dump it on one side of your desk. You lean over to the other side, trying desperately to redistribute the weight, and you know your APS Alpha 10 drives have arrived.

Once everything is nicely balanced you review the situation. What you have here is nothing like the PC XT, the standard hard disk variant on the IBM PC. This particular beast offers twin 10Mb removable disks in a very large box which takes up a volume comparable to the business section of the IBM. Fortunately it doesn't take up as much desk space, since they're stacked on top of one another, but the fan does produce another substantial blast of hot air for the poor sucker sitting opposite.

## Setting up

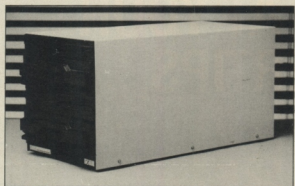
Getting the Alpha 10 going is easy once you know how: the trouble is the manual—six pages of A5 if you exclude the Sirius section—isn't totally helpful.

The hardware hook-up is fairly obvious. You slot the IBM personality card provided into the PC, connect the ribbon cable to the drives, and wonder what to do next.

The main power switch is round the back of the drive unit. The business end houses two large black 8in cartridges, and the drive doors come as a sort of cowl affair which pulls down and locks while the drive is turning. Above each drive is a switch with two lights on. The yellow light indicates the drive is turning, while the red one tells you it's being accessed. Press the switch and the drive motor stops. Once the drive has stopped turning, the door springs up.

You need to reboot the PC with the system disk included, then run Megacheck, which prepares the cartridges for use. The first page of the manual tells you that the Alpha 10 drives will be addressed as C and D (E and F if you have an XT) so it comes as a bit of a shock when Megacheck tells you to specify a drive from 0 to 3. These turn out to be four cartridge units, and don't include the floppies already installed.

For a new cartridge you should select option e first, followed by option f. Option e erases the cartridge, and allows you to name it, should you wish. Option f formats it ready for use. The menu says of e 'initialises the root directory and FAT' and of f 'formats the z track'. I found this confusing, and was even more confused by the explanation, misprinted as c, saying 'format track 0 and 1 with E5'. Option f asks you to specify various



## PCN PRO-TEST PERIPHERALS

parameters such as interleave, CRC on or off, ECC on or off and dwell-time counter. These will be relatively opaque to the novice user, and this isn't helped by the way it asks you to respond in hex. But just hit Return and it'll specify default values, so once you've worked this out you shouldn't have too many problems.

## In use

In general the drives are pleasingly fast, but you may find you have to adjust the dwell-time counter to maintain this. A drive shuts down if it isn't accessed for a preset time, so if the time you set is a little short for the use you want to make of it you have to wait for the motor to restart before you can tinker with your pearls of wisdom.

In these situations the drives are slower than most floppies, and unfortunately it's not particularly easy to reset the dwell-time once you have data on the cartridge.

Software is usually a bit of a problem when running a hard disk, as many of the programs you'll have in stock won't be configurable for it, and others will have little niggles that stop them working efficiently. Computpro, the supplier of the Alpha 10, conceded that 1-2-3 wouldn't work with them, but I got Volkswriter Deluxe working with it fairly easily.

Being a cautious soul I decided to keep a backup disk—this, as it turned out, was my first mistake. It made sense to keep the program and data all on the one cartridge, then use the backup procedure from Megacheck to clone it onto the second cartridge. Unfortunately, this appears to be a sector by sector copy and, lo and behold, the program corrupted as it was copied across.

The standard PC DOS `command.com` worked much more efficiently, and was faster, so the Megacheck backup seems pretty redundant to me. The thing to remember, of course, is to copy the good program onto the cartridge with the bad

program on it, not vice versa.

Nothing daunted I soldiered on, and discovered a frustrating little oddity. The Alpha 10 manual never actually tells you to switch the unit on, though we can assume most people will work out that they have to. The burning question is, when do you switch it on? Laugh if you like, but listen first.

When the drives are powered up, they start turning, and seem to whip through some sort of diagnostic

routine, subsidiary to the PC's. Now, if you switch them on first before booting up the PC, all is well; however, switching the PC on and then switching the drives on is a whole new ball game. More often than not the PC will be unable to read the cartridge, and the drives will lock up, forcing you to power everything down and start again.

This is particularly disturbing because the small shut-down switches at the front usually won't operate in this state, so you have to power the unit down while the drives are still turning.

I couldn't work out exactly what was going wrong, but there really should be a note in the manual telling you the correct order to do things in.

## Verdict

I'll say at the outset that the idea of paying £3,400 for anything fills me with horror. That said, you're still talking about this sort of level for a hard disk unit. With just two cartridges the Alpha 10 has twice the storage capacity of most hard disks, and the fact they're removable is good for security, and means you can increase your storage capacity simply by buying another cartridge. On the security front, by the way, did you ever hear the US Navy used to dismantle its disk drives every night until it discovered cartridges?

Convenience factors aside, there are still questions about the Alpha 10. Something this price surely deserves a decent manual. The one with the unit just doesn't shape up, and is liable to confuse anyone who doesn't have relevant experience.

What I think we're really looking for here is a step by step beginners guide that simply tells you how to get it going, followed by increasingly technical sections with examples of possible uses for some of the software's facilities. This would pay off in the long run, as the more experienced customers are in the use of products, the more likely they are to buy more of them.

PCN

Alpha 10 cartridge hard disk system Price £3,400 plus VAT System IBM PC Other variants Sirius, IEEE Supplier Computpro, 01-631-3253

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## SOFTWARE

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Note to software publishers: If you wish your company's product to be included, please send only the very latest releases to Bryan Skinner, Software Editor, PCN, 62 Oxford Street, London W1A 2HG; and please don't forget to include prices and a telephone number.

## GAMES

*Crusoe* for the Spectrum is an unusual adventure as it displays the figure of Crusoe on his island, amid fruit trees, cacti and dangerous beasts. You direct the castaway's moves and tell him to eat, drink and so on, while details of this lonely heart's life status, including vigour, thirst and hunger fill the rest of the screen. Colourful and fun at first, the slow keyboard response, the tiny map and the game's lethargic progress make the game's success less than certain.

*Factory Breakout* is a three screen arcade-style game, with five selectable levels of difficulty featuring Zirk the robot. The program is really a series of loosely linked games, each quite well done, but still lacking in star appeal.

The excellent *Choc a Bloc*

*Charlie* on the 64 is a sort of *Pengi*, but the graphics, sound and difficulty make it one of the best versions we've ever seen. The program loads quickly with Pavloda and Charlie starts in the middle of a rectangle of blocks. The aim is to shunt the four purple blocks together to create a time door through which he can escape. Charlie can hurl grenades to move blocks, which rapidly expends his energy. A major problem is each purple block is the only barrier between him and the four guardians, so strategy is essential. There are 16 levels, but the game's so tricky that getting past the first level before Charlie's time or energy run out is high on impossible. Nice one.

*Commodore* hasn't forgotten its Vic 20 following and has added two new games for the unexpanded Vic, and another for the Vic with 16K expansion to its range. *Rapier Punch* puts you in a gloomy room searching for a hidden treasure chest. Only your immediate surroundings are lit. You must be a fast-mover as there's a timer, and spinning crosses, dragons and their eggs to hamper your murky progress by ending one

of your three precious lives.

*Starbase* has a *Defender*-type background, and you move a cursor over alien ships to prevent them stealing scientists. We've seen better games than these on the unexpanded Vic.

In *Bomber Mission* you take the hot seat of a World War II fighter bomber in this part-simulator, part-strategy game. You must select targets in the time available, shooting down enemy fighters as you go.

Now *The Evil Dead* is finally here, it's a disappointment. There are no instructions, so unless you've seen the film you only know you're supposed ultimately to throw a book you find on the fire. The location is a series of rooms seen from above, and moving to the edge scrolls the screen left or right, not that there's much to the house. Weapons such as axes, swords and what look like baseball bats have different effects on the creatures you encounter, which include disembodied legs and hands, green demons, zombies and the like. The graphics are simple, the sound's fair, but the game lacks the excitement promised by the advertising.

## UTILITIES

Graphs are popular this week, and R & P's *Instant Graph Plotter* for the Dragon looks good. The 27-page manual details how to use the package with many examples. You can specify up to 25 data points and a number of useful routines such as area under curve, tangents and calculation of averages are included.

*Data Plot* on the Spectrum is far simpler, but offers the display options of graph or tabular format with automatic scaling. This one comes with sample data sets to let you see how the program can be used, but there's precious little documentation.

*Random Access Mailing* on the BBC is a sort of database system for bulk mailing applications. It's a dedicated system which prompts you for entries against headings like address, telephone number and contact, and has facilities for using some Wordwise commands. Data can be sorted, searches performed, labels printed and so on. *Micro Aid* can also provide suitable stationery such as labels and letter headed fan-fold.

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## ZX81

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# INTEGRATION

**T**here are probably more database programs on the market than any other type of software and this has led to confusion for users and dealers alike. So when another database package is announced what really is the difference and who is it for?

## Features

Database Manager II is aimed at existing users of programs like WordStar, Multiplan, VisiCalc, Volkswriter and Easywriter. They all have one thing in common — lots of data already stored for use with these programs. When they want to add to their software or use another program with the existing data they must start all over again entering the same information details, which can be a waste of time and effort.

The new package allows users to change software and use existing information without any time-consuming re-entering of the details. It's also a powerful database system in its own right, so moving up from a single-purpose program like WordStar, or Multiplan to Lotus 1-2-3 can be done with a minimum of bother.

## Documentation

Apart from the manual with its five sections of introduction, data integration menu, applications, appendices, and an index, there's also a cassette tape for people who don't read manuals.

## Getting started

Database Manager II needs 128K RAM with DOS 1.1 and 192K under higher versions of DOS. The package consists of a program disk, data disk, cassette and the manual. The first operating step is to make working copies of the program. After formatting a disk the modules are transferred from the master program disk to the working one. And in fact the one master disk contains sufficient modules for two working program disks. Update 1 and 2. Alternatively, the program can be installed on a hard disk system. With the master program kept safely, additional working copies can be made if anything happens to the disks in use.

After loading the working copy, you'll see that the main menu has 18 different options. Aside from option 14, data integration, there are all the normal choices of entering data, viewing it, sorting, searching, changing, deleting, calculations, or reports.

## In use

Apart from the data integration feature, the program uses Soundex phonetic search. This means that even if a mistake is made in the details entered for a search, DBMII can still find it.

The integration feature allows information on a spreadsheet like Multiplan to be turned into mailing labels and standard letters. A number of Multiplan or 1-2-3 spreadsheets can be consolidated into a file where size is limited only by the disk capacity. Later on, the consolidated work-



This IBM database program greatly impressed Neville Ash.

sheets can be sorted or searched as a single large file.

The first step is to create an input form with the relevant headings — fields. When this form is used, at the bottom of the screen the restart, skip to, end, previous entry, back-up and date options are all initiated by function keys. When viewing records already entered, the options are next record, main menu, change forward, reverse and jump.

Sorting offers two basic choices: fast in memory sort with report generation or multi-level disk sort. The fast sorting facility is limited to a maximum of 2,500 records. Sorting can be carried out alphabetically, numerically or by date in ascending or descending order. Using the integrating power, there are two options. You can create a DMBII database from information stored in Lotus 1-2-3, VisiCalc, Multiplan, dBaseII or ASCII files. This is known as importing. The other option is to move information from DBMII to one of these programs.

To send information from Lotus 1-2-3 to DBMII, select option one from the data import menu. State which drive contains the 1-2-3 worksheet and the program will show a directory of all the .WKS files on disk. If the file had field names enter Y for Yes, then enter the name for this new database.

As there is a limit of 40 fields per record, the spreadsheet file should be edited down to this figure before transferring, or DBMII will tell you the file contains too many columns.

With Multiplan, the file must be stored in symbolic form, so data has to be loaded into Multiplan, then **TOS** — transfer options symbolic — is typed, followed by **RETURN** and then the data is saved to disk by entering **TS** — Transfer/Save — together with the file name.

To extract information from a WordStar or similar text file, the **DEX** — data

exchange format — is used. This is option eight on the import data sub-menu.

To use data from DBMII with other programs the data export menu is used. So information from DBMII could be used in a Lotus 1-2-3 worksheet file. Option 14 is selected, then option one — DBMII to Lotus, select the drive for the .WKS file, answer Yes to transfer the file. Enter the record number to start at, the number of records and the files which are to be transferred. Similar approaches are used with Multiplan, dBaseII, VisiCalc, etc. I've concentrated on the integrating side as this is the main feature of the program, but it's also a friendly database system in its own right.

Each of the records can hold up to 40 fields of 60 characters each — 2,400 characters per record, with the only limitation being disk capacity.

## Verdict

This is a very useful program, especially for users of existing IBM PC programs who want to start using the integrated packages without having to enter all that information again.

### RATING (5)

#### Features



#### Documentation



#### Performance



#### Usability



#### Reliability



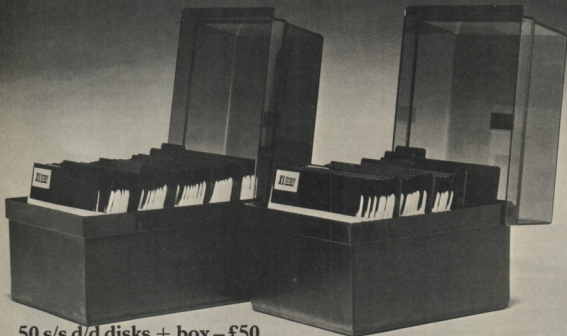
#### Overall value



**Name** Database Manager II — **The Integrator**  
**Application Database Price** £210 **System** IBM  
**PC Distributor** Reflex, Wellington Industrial Estate, Basingstoke, Spencers Wood, Reading RG7 1AW. 0734 884611 **Format Disk Other versions** None **Outlets** None.

Compaq computer used for test supplied by Computershop, Stonebridge Park, London NW10 7QZ.

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# GRAPHIC ACCOUNT

Hard-copy visual displays of data are now possible on your 64. Barry Miles explains.

What do you do when you've produced a neat set of data from a spreadsheet on your Commodore 64? Obviously you need to take advantage of your machine's graphics capabilities and draw up a nice graph, perhaps dump it to a printer to impress your bank manager. Well, now you can, thanks to Chartpack-64 which is based on the already successful command system found in Screen Graphics-64 and Ultrabasic-64.

## Getting started

The disk is DOS protected with a front end loader which, when installed, requests a secondary address should your particular printer require it. You're also asked if your printer interface needs any ASCII translations and reminded to set any interface switches. If you own an Epson you're fortunate because there's a special version of the program for you. For the rest of us, the manual gives helpful details of suitable interfaces, but all of them American. I used 'The Connection' to interface an Epson FX 80 to my 64.

Although the disk is protected, the publishers are generous enough to supply back-up copies of the program on the disk.

## Features

Chartpack reads sequential data files and from these can produce the sorts of labelled charts, line and shaded bar graphs shown in the illustrations, as well as pie charts. You can specify maxima and minima, base values for the axes, bar grouping, legend placing and screen colours. Two sizes of graph are available: there's a normal high-resolution screen dump for small charts and a slower dump which will fill an A4 sheet of paper.

Limitations are a maximum of 200 data

points and the default setting is four data sets of 50 points each.

## Documentation

This takes the form of a carefully planned, 48-page A5 booklet, which starts with full loading instructions and goes on to a series of very useful definitions which will aid newcomers. There's a detailed tutorial based around data to hack in, as well as data contained in sample files on the disk — two very useful methods of getting to grips with the package.

An in-depth reference section and appendices follow.

## In use

Access to Chartpack's facilities is via one main menu and eight sub-menus. A good feature is that the current menu number is displayed at the top left of the screen and you can return to a higher order menu by entering zero. As a panic measure you can always hit the RUN/STOP RESTORE combination, but to get back to the main menu without loss of data then requires entering GOTO 5 — somewhat messy.

The programmer has put a lot of effort into making the package pretty user-friendly. In fact, the user with no programming knowledge at all can create charts for presentation with a few minutes practice.

Part of the package's flexibility comes from the fact that the format for a given chart is controlled by a data file, so you can store a number of these for use with various sets of data. The ability to get hard copy of the charts is what turns this inexpensive program into a real business tool.

There are some nice 'default' touches, for example: if you try to display a chart which you haven't yet specified you're taken straight to the Chart Type Selection

menu. Once a chart has been displayed on-screen it can be instantly recalled by pressing one of the function keys. Similarly, F5 allows you to jump from the disk display to the main menu.

Once you have a chart exactly as you want it you can save it to disk as a graphics screen, much faster than loading the data sets, the chart definition and redrawing.

## Verdict

Chartpack offers a great deal for a low price. Its main use will probably be to make the daunting rows and columns typical of spreadsheet calculations accessible to a wider audience, and more immediately comprehensible to those who need to see results quickly. The program is easy to use and lets you redesign graph formats with the minimum of fuss.

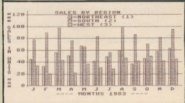
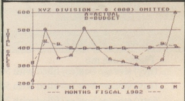
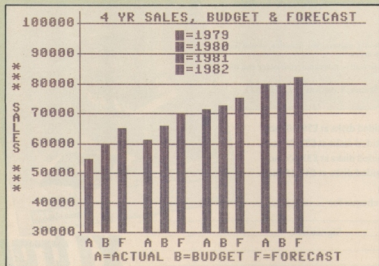
PCN

## RATING (/5)

- Features
- Documentation
- Performance
- Usability
- Reliability
- Overall value



**Name** Chartpack-64 **Application** Graphing **System** Commodore 64, 1541 disk drive, 1525/1526 printer (or Epson FX80/Gemini-10/15-plus interface) **Price** £24.95 **Publisher** Abacus **Format** Disk Language Basic/machine code **Other versions** None **Outlets** Adamssoft, 18 Norwich Avenue, Rochdale, Lancashire 0706-524304



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NEW

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4. MUSIC SYNTHESIZER PROGRAMMING.
5. GRAPHICS PROGRAMMING.
6. BASIC FROM A DIFFERENT VIEWPOINT.
7. COMPARISON OF THE VIC 20 AND THE COMMODORE 64.
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For those readers that need to delve deeply into the computer, we've included a fully commented listing of the ROMs. Here's an authoritative source for Commodore 64 information.



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## SPECTRUM

## Tennis menace

**Name** Match Point System Spectrum  
**48K Price** £7.95 **Publisher** Sinclair  
**Research** 0276-685311 **Format**  
 Cassette **Other versions** None **Outlets**  
 Retail/mail order

Wimbledon may be over, but that doesn't mean you have to forget tennis for another year. Sinclair has just released *Match Point* to let you act out your favourite McEnroe fantasies.

The game closely resembles Atari's *Tennis*, and while you can't play doubles, you can play against your Spectrum or a human opponent, or just sit and watch an exhibition match.

## Objectives

Beating your opponent is the name of the game and as this version is played according to standard lawn tennis rules this means winning a match which is played over three or five sets, the winner being the first to reach either two or three sets respectively. Within each set the winner is the first to win six games and have a clear lead of two. All the rules are clearly explained on the inlay and, as the computer keeps the score, there's no point challenging it.

## In play

The view over the green court is from the commentary box, the umpire sitting halfway down on the right and the ball boys crouching at mid-left. They even run onto the court to retrieve net shots. The players

are very well drawn, though they're somewhat knock-kneed and their rackets on the large side.

The crowd is shown by simple blobs of colour in the spectators' stands, while the player's names, the previous sets, the current score etc, are displayed at the rear of the court and any linesman's calls are shown at the foot of the screen.

Choosing skill levels means selecting the quarterfinals, semifinals or if you feel capable, the finals themselves. There is also the option to select the number of sets — one, three or five.

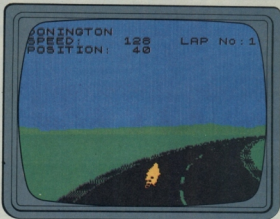
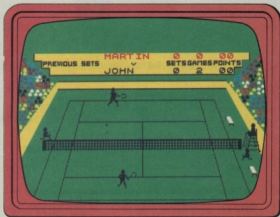
Control is via keyboard or joystick, and while a joystick is really necessary to make the most of the game, you can customise the keyboard control for each player. The Psion program automatically sets your stroke to fore- or back-hand, but sometimes it seems a bit arbitrary as to whether you hit the ball or not. The type of shot is also varied according to your movement when you hit the ball, giving lob shots, volleys and drop-shots.

## Verdict

With the two player option, the classy graphics and the number of options, Sinclair has produced a good'un — far better than some of its recent attempts to entice Spectrum owners.

Clare Garton

<b>RATING</b> (/5)	👍👍👍👍👍
<b>Playability</b>	👍👍👍👍👍
<b>Lasting appeal</b>	👍👍👍👍👍
<b>Use of machine</b>	👍👍👍👍👍
<b>Overall value</b>	👍👍👍👍👍



## Lapping it up

**Name** Full Throttle System  
**Spectrum 48K Price** £6.95 **Publisher**  
 Micromega, 01-223 7672/7904  
**Format** Cassette **Language** Machine  
 code **Other versions** None **Outlets**  
 Retail

*Full Throttle* borrows heavily from *Pole Position* and is Micromega's follow-up to *Code-name Mat*. It's a 500cc motorcycle racing game with 40 competing riders and ten race tracks.

## Objectives

Your aim is not to cover as many miles as possible in the shortest time, nor to set the fastest lap time. Your task is simply to come first.

## In play

Once loaded you're presented with maps of the ten tracks, from the relatively simple Silverstone to the horrendously complex Nurburgring. Having selected one of these you either opt for a practice bash on your own or decide how many laps you want the race to be (up to five). Then it's off to the starting line and away.

There are only four controls: right, left, accelerate and brake. Acceleration takes you to the top speed of 175mph quite quickly, with a rising buzz mimicking the exhaust note. Right and left lean your bike across the track and braking is quite harsh. The temptation is simply to burn up to max speed and hold it there, which you soon discover is a lousy strategy as you career off the track and into the grass on your first corner.

It's best to make a few practice laps of each circuit before getting into racing proper. This lets you trundle round any course at a leisurely rate, learning the vagaries of the course and how best to tackle bends. The best policy is to hammer into left-handers, choosing a line from the right of the course, while right bends require a more careful approach from the left, braking as you enter the bend, and accelerating briskly round the apex. This is fine on your tour, but harder when you're jockeying for position with up to forty other riders.

My favourite feature of the game is the skid — really authentic this. The idea in motorcycle racing is to go into a bend just fast enough to drift (skid) round, but under control. While the control in this version is limited, it's still great fun and very well done indeed, with a neat sound effect. I also liked the fact that clashing fairings with another rider or coming off the track doesn't stop the game — you simply lose speed.

## Verdict

*Full Throttle* is not an easy game.

The graphics are reasonable, the road and mountains scroll around quite smoothly but the riders are a bit flickery. The sound is adequate and the game just compelling enough to make you have 'just one more go' to beat the others.

Bryan Skinner

<b>RATING</b> (/5)	👍👍👍👍👍
<b>Lasting appeal</b>	👍👍👍👍👍
<b>Playability</b>	👍👍👍👍👍
<b>Use of machine</b>	👍👍👍👍👍
<b>Overall value</b>	👍👍👍👍👍



BBC B

# Deadly dangers

**Name** Monsters and Magic System  
**BBC B Price** £6.95 **Publisher** ISP, 01-351 5867 **Format** Cassette  
**Language** Basic **Outlets** Retail/Mail order.

In the alliterative style of *Dungeons and Dragons*, *Monsters and Magic* is a fantasy adventure game featuring castles, giants, evil auras, headless idols, temples, treasure and the usual trappings of a warped imagination.

## Objectives

Cast as a Luis Palau of yore you have been despatched to search for the 'Word of Truth'. Instructions abound on the colourful inlay card although, instead of simply listing the essential command words, it rather unhelpfully suggests that you should jot them down after they appear on screen.

## In play

Before loading the main game you must choose your character from those perennial crusaders: Fighter, Cleric, Thief and Ranger. Having then elected to join a race of humans, dwarves or elves you are allocated a performance rating for your dexterity, strength and intelligence.

Having loaded the game, you may buy various weapons and magic rings to assist you on your travels. There is also an assortment of baddie-bashing spells available such as STUN

and MIND BLAST.

Apart from a small schematic diagram of each room this is virtually a text-only adventure. Unfortunately, the text is so banal that you may be tempted to add a few choice phrases of your own to liven things up.

After commanding the computer to OPEN the pub, GET me a pint, DRINK my health, SPELL 'Mississippi', RELEASE George Davis, HIT the road and then DROP dead, there came the rather ill-bred retort — 'Eh?'

The program's vocabulary being seemingly exhausted, I wandered around the corridors smashing vials of holy water while roughing up a few giants on the way.

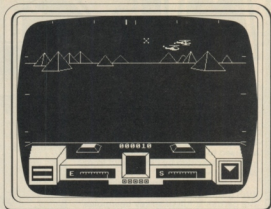
Behaving like that I was, not surprisingly, soon dead. As if to compound the tedium I had to reload the datafile containing the dungeon 'module' each time I wanted another go — which wasn't often.

## Verdict

Somebody, somewhere, has previously overestimated the gullibility of the software market, not to mention its spending power. Quite why anyone should bother with this one is beyond me. Almost identical textual games are so well established that they have become part of micro folklore. In fact, the most hazardous part of this 'adventure' was getting it to load in the first place.

Nick Rann

**RATING** (/5)  
**Lasting appeal**  
**Playability**  
**Use of machine**  
**Overall value**



# Firing practice

**Name** 3D Tank Zone System BBC B  
**Price** £8.95 **Publisher** Dynabyte, 0226 07707 **Format** Cassette  
**Language** Basic machine code  
**Outlets** Retail/mail order.

Three dimensional battle games may be bombarding us from all angles but this sophisticated new version from Dynabyte has several striking differences — not least the introduction of aircraft into the area of combat.

## Objectives

As commander of the city's defences you must destroy marauding enemy tanks and aircraft using either joystick or keyboard. A comprehensive set of instructions and play options precedes the main game.

## In play

Viewed through the missile command scanner the panorama features the green on black wire 'graphic style' (favoured by its Arcade fore-runners) to create an excellent 3D effect. The usual pyramids and missile sites populate the foreground above which fighter planes and helicopters attack in horizontal waves.

Beneath the battle zone is an instrument console which monitors your energy and shield strength levels. It also features a circular radar scan for locating unseen enemy tanks and an early warning alarm for impending air-raids.

The air-raid and tank battles are almost completely independent entities although both

appear on the screen simultaneously.

In the tank battles radar is used to pinpoint the enemy tank position and then the scanner is rotated through 90 degree steps until the tank is in view. Although the tanks are continually dodging around you can usually see them off in the early stages through skilful aim.

Although air raids aren't as potentially destructive as the tanks, successive raids can chip away at your protective shields. To deter them you're equipped with a fully manoeuvrable anti-aircraft gun which requires split second timing and accuracy for a direct hit. The graphic detail on the helicopters and jets was so good it seemed a shame to blow them up — still, mustn't forget there's a war on.

With so much going on, the screen is surprisingly uncluttered and the visual impression crisp. Using up to nine keys while alternating between the two areas of contention may seem a bit of a handful. However, the objectives are always achievable and a typical game will last about five minutes.

## Verdict

The authors obviously recognise that, rather than being blown up every ten seconds, players are encouraged to develop their skills and enjoyment by scoring successes early on in the game. Thoughtful design plus innovative, professional production place *3D Tank Zone* in the top flight of its kind.

Nick Rann

**RATING** (/5)  
**Lasting appeal**  
**Playability**  
**Use of machine**  
**Overall value**



# Mega the MillipeDE

**Title:** Mega the millipe  
**Machine:** Spectrum 16/48K  
**Language:** Sinclair Basic  
**Application:** Game  
**Author:** Peter Lloyd

The Spectrum's scrolling capabilities are used to the full in this fast-moving game. It is written by Peter Lloyd from Weobley in Hereford.

You must guide Mega the millipe through the garden as it scrolls past. The garden is full of spikey beanpoles and skull-and-crossbones which you must carefully avoid. As you dodge in and out of the beanpoles you encounter many goodies which you eat to score points. These tasty morsels include Megafruit, smiling pumpkins, bottles and bananas and they are scattered around the garden in abundance.

Mega, no ordinary millipe, is blue with a white flashing head and you can move him diagonally left and right in his constant downward slide by pressing the 0 and 1 keys.

As you steer Mega around the garden you are treated to a musical rendition of *Polly Doodle*. You have four lives and there is a high score displayed between each game.

The program has one POKE only, at location 23692 and this sets the automatic scrolling so that the scroll? prompt does not appear.

Programs 1 and 2 should be typed in separately. Type in program 1, which sets up the user-defined characters, then save and run it. Next, type NEW and type in program 2. The user-defined characters should be present in the listing as you type it in.

To save the whole game as one program type GOTO 2000. You should not stop the tape after the first part has been saved, as the user-defined characters will automatically save after this. **PC**

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Nickie Robinson, *Personal Computer News*, 62 Oxford St, London W1A 2HG.

All disks and cassettes will be returned as soon as possible after evaluation or publication.



## Program 1

```

1 REM *****
2 REM ** Character Poking **
3 REM ** Program for **
4 REM ** "MILLIPEDE" P.Lloyd **
5 REM ** for P.C.N. © 1984 **
6 REM *****
7 REM
10 BORDER 2: INK 6: PAPER 0: B
RIGHT 2: CLS
20 FOR A=0 TO 6
30 READ A$: FOR B=0 TO 7: READ
D: POKE USR A$+B, D
40 NEXT B
50 BEEP .2,30: PRINT " ", CHR$ (
CODE A$+79): NEXT A
100 DATA "A",98,38,255,178,38,2
55,102,34
110 DATA "B",60,126,255,210,255
,126,38,102
120 DATA "C",16,60,94,126,94,62
,60,24
130 DATA "D",65,93,42,62,20,28
,99,65
140 DATA "E",62,127,107,127,93,
65,62,28
150 DATA "F",60,24,60,110,86,10
6,86,126
160 DATA "G",128,96,56,44,54,26
,15,3
200 BEEP .5,-10: STOP

```

## Program notes

## Program 2

Program notes ...	20 BRIGHT 0: FLASH 0: INVERSE
20 Resets BRIGHT, INVERSE, FLASH and OVER settings to ensure functioning of attribute statements	0: OVER 0 40 FOR A=0 TO 40 STEP 10: BEEP .1, A: NEXT A 60 GO TO 1000
40 Opening notes of program	500 BORDER RND*6: FOR A=0 TO 5: PAUSE 10: NEXT A: BORDER 0: IF INKEY\$("<") THEN RETURN
500-520 Flashing border until key is pressed	1000 GO TO 300 1000 LET HI=0: GO TO 1520 1040 PRINT AT 21,0 1060 PRINT : PRINT AT 10,X; BRIG HT 1; INK 7;"B"
1000 Initialise highscore	
1040 Start of main routine. Prints at bottom of screen to produce scrolling effect	
1062 Empty print statement scrolls screen, prints head of millipede	
1080 Prints killer beanpole at row 20 in a random position	1080>PRINT AT 20,RND*29; BRIGHT 1; INK 3;"AAA"
1100 Prints random goodie at row 21	1100 LET A=INT (RND*5)+2: PRINT BRIGHT 1; AT 21,RND*29; INK A; CHR \$ (144+A)
1120 Poke to stop 'SCROLL?' appearing on the screen, [shift] A halts program	1120 POKE 23692,255: IF INKEY\$="A" THEN GO SUB 500
1140 [shift] Z aborts current game	1140 IF INKEY\$="Z" THEN GO TO 1520
1160 Displays head in blue	1160 PRINT AT 10,X;"B"
1180 Checks for keyboard input and ensures Mega hasn't gone off the side of the screen	1180 LET X=X+(INKEY\$="0" AND X<31)-(INKEY\$="1" AND X>0) 1200 IF ATTR (11,X)=67 THEN GO T O 1320 1220 IF ATTR (11,X)>64 THEN LET SC=SC+(ATTR (11,X)-60)*10: BEEP .003,40: BEEP .003,20: BEEP .003,30
1200 If Mega has bumped into skull or beanpole, GOTO 1320	1240 PRINT AT 1,0; BRIGHT 1; INK 4;"SC:";SC; INK 6;" LI:";L
1220 Mega eats goodie, increases score	
1240 Displays score and number of lives	1260>READ Z: IF Z=99 THEN LET Z=0: RESTORE 2100: LET P=INT (RND*10)*2
1260 Reads data, changes pitch of tune	1280 BEEP .003,Z+P 1300 GO TO 1020 1320 LET L=L-1: IF L<1 THEN GO T O 1360
1280 Plays note of pitch read in line 1260	1340 FOR A=7 TO 0 STEP -1: BEEP .05,A*5: OUT 254,A*20: BORDER A: NEXT A
1300 Repeat main routine	1360 GO TO 1020
1320 Crash subroutine, reduces number of lives	1380 FOR A=10 TO 2 STEP -1: BORD ER RND*7: BEEP .075,A: BEEP .075,A-1: BEEP .075,A-2: NEXT A: FOR A=1 TO 10: BORDER RND*7: BEEP .075,A: BEEP .075,A-1: NEXT A: B O R D E R 0
1340 Plays scale with flashing border	1400 BEEP .5,10: CLS
1360 Goes to start of main routine	1420 BORDER 0: INPUT "": PRINT A T 5,6; INK 6; BRIGHT 1;" G A M E O V E R !"
1380-1400 Plays scale with flashing border	
1420 Game over	
1440 Prints score	1440>PRINT AT 10,5; INK 4;"Score : "; INK 5;SC
1460-1480 Changes high score if increased and prints it in flashing colours, prints score	1460 IF SC>HI THEN LET HI=SC: PR INT AT 14,5; FLASH 1; INK 2; PAP ER 6;"HIGH:"; INK 5; FLASH 0; PA PER 0;" ";HI: GO TO 1500
1500 Time delay to observe screen	1480 PRINT AT 14,5; INK 4;"High: "; INK 5;HI
1520-1560 Reset variables	1500 FOR A=0 TO 100: OUT 254,A: BEEP .005,A/5: NEXT A
1580-1660 Data for the title (these are graphics characters found on keys 1 to 8)	1520 LET X=15: LET L=4: RESTORE 1540 INK 1: PAPER 0: BORDER 1: C L S 1560 LET SC=0 1580 DATA " _ _ _ _ _ _ _ _" L _ _ L _ _ 1600 DATA " _ P _ I _ _ _ _ _" _ _ I L _ "



**BBC Teletext adaptor**, £185 ono. Cumana flat height 100K disk drive + cpu including manual, cable, format disk, £165 ono. Excellent condition. Tel: 01-858 2449.

**Z8 Spectrum**, SP-80 RAM pack compiler. Beta Basic, Fort, Pascal, Disassembler, Vu-File, Chess, Flight Simulator, Melbourne Books, + extras. £200 ono. Jan Rowald, Strömness, Stegane 23, 5088 Mjølkærken, Norway.

**Acorn Electron** for sale. Data recorder and cards included. Five software tapes and blank tapes. Excellent condition. £165 ono. Tel: Warrington (0925) 571584.

**ITT 8200 48K £250**, integer card + prog. Aid #1 £50, 16K ramcar boxed as in £50, parallel printer £25, disk drive card £3 and lower case adaptor board rev (0-7) £15. Call Keir (0683) 43079 evenings. Offers considered.

**Spectrum Protek** interface £7, Games £65, Hunter Killer 16, Vu-File £4, Vu-3D £4 and other software. Phone Chris on Cardiff 743384.

**Lynx 48K manual**, user magazines, Lynx books, £54 worth of software including assembler £150.. Tel: (0928) 33431.

**Commodore 64**, C2N, 1541, 1701. Warranties, discs, cartidges, tapes, games, cassette, assembler tutor, books, magazines, new £930, sell for £500 ono. Telephone (0342) 712623.

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**V20**, C2N, Super Expander, 16K, cartidges, adventures, and £70 worth of games, Maplin Voice synthesiser and leads, more, £120. Tel: Ws M 0934 510842.

**Wanted** 2 joysticks for Atari. Phone (0963) 6896 and ask for Paul (any morning or between 4pm and 6.30pm).

**2 48K Spectrums**. Interface one, Micro-drive, Seiksha GP-100A printer, Prin-

ter interface, Sinclair printer. All less than year old. £420 ono. Tel: Swansea 0792 69688.

**BBC B**, OS 1.2, lots of software, games, adventures, disks, plus magazines, £375. Write to Mr Tufano, 6 Myrtle Close, Robinswood, Gloucester GL4 9YP.

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**Wanted** Commodore 64 for exchange. Texas TI99/4A, plus deluxe Polaroid colour camera, plus £35 (if Lynx 96K). Tel: Minsterley (Shropshire) 074 374 686.

**Dragon 64**, still boxed, £180 or with extras, eg books, dustcover, cartridge, games, manuals etc. For exchange. Will separate. Tel: Kidderminster (0562) 743968 evenings.

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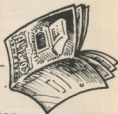
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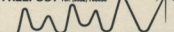
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## Buffoonery with Basil

If the latest Laughline proved one thing, it was that John Cleese isn't a reader of PCN.

In this he joins Geoff Boycott and Eric Brown.

How do these people get through the week?

With no entry from Mr Cleese himself the competition was wide open. There were puns galore on Manuel/manual, and a few on the Sony theme from readers who obviously prefer the noOlympic channel.

But the caption we liked best for its terseness, simplicity, and overtones of violence came from Nick Looker of Ely: 'All right, Manuel. Me Basil; this monitor; this poke in the disk drive.' Nick wins the £20.

## Love on a microchip

If you thought your micro had a bit of a twinkle in its eye last time you used it, then beware, it could be love.

This is the theme of *Electric Dreams*, a new film from Virgin Pictures. The rather sentimental and corny script follows teenager Miles Harding who buys a personal computer to help him organise his love-life. His rather-cleverer computer is soon composing love songs to romance the girl upstairs. The problems start when the computer falls in love as well and won't let itself be switched off.

The graphics are impressive and used to very good effect which means that despite a watery plot it is a compelling film, and if in future you hear a little Bach tripping out of your computer you'll know to switch it off while there's still time.



The eternal triangle.



## SLANTAX ERRORS

Reporting Sinclair's ambitious plans last week we blandly accused them of aiming to sell £850,000-worth of Spectrums this year. That works out to about 8,000 machines, and as you may have read lower down in the report Sinclair will soon be producing 200,000 a month. Overkill? A sledgehammer to crack a nut? Not a bit of it. Sinclair is hoping to sell 850,000 Spectrums.

## NEXT WEEK

**Bolt-on Lightning** — We Pro-Test White Lightning, the extended Forth-like system that looks like the hottest Spectrum software for some time.

**Streets of London** — Find your way around the capital with our Epon HX-20 feature.

**Home Grown** — Down and almost out a year ago, the Radionics home control system is thriving again. We check out what it could do in your fixed abode.

**Vocal Dragon** — Could your Dragon sing 'Old MacDonald' while drinking a glass of water? Maybe, with the Jamar speech synthesiser.

**Caramba 64** — Turn into a torero with our bull-fight program listing for the Commodore 64.

## PCN DATELINES

PCN Datalines keeps you in touch with up-coming events. Make sure you enter them in your diary.

Organisers who would like details of coming events included in

PCN Datalines should send the information at least one month before the event. Write to PCN Datalines, Personal Computer News, 62 Oxford Street, London W1A 2HG.

## UK EVENTS

**Event**  
Acorn User Exhibition  
Electron & BBC Micro User Show  
IBM System User Show  
Hampshire Computer Fair  
Walthamsoft '84

PCW Show  
Computer Communication & Control  
Computer Graphics FX Exhibitions  
Electron & BBC Micro User Show  
Computers in Action

**Dates**  
August 16-19  
August 31-Sept 2  
Sept 3-5  
Sept 6-7  
September 8

Sept 19-23  
Sept 26-28  
October 9-11  
October 25-28  
October 30-Nov 1

**Venue**  
Olympia, London  
UMIST, Manchester  
Olympia  
Guildhall, Southampton  
Walthamstow, London

Olympia  
Brighton Centre  
Wembley, London  
Alexandra Palace, London  
Anderson Centre, Glasgow

**Organisers**  
Computer Marketplace Exhibitions 01-930 1612  
Database Publications, 061-456 8383  
EMAP International Exhibitions 01-837 3699  
Testwood Exhibitions, 0703-31557  
London Exhibitions and Promotions 01-554 5039-3498  
Montbild 01-486 1951  
Institution of Electrical Engineers 01-240 1871  
Online Conferences Ltd 01-868 4466  
Database Publications 061-456 8383  
Trade Exhibitions, 0764 4204

## OVERSEAS EVENTS

**Event**  
Computers in Education Exhibition

SE Asia Regional Computer Conference  
Computer Exhibition — Comdex/Europe

**Dates**  
Sept 3-5

Sept 24-27

October 29-Nov 1

**Venue**  
Sydney, Australia

Hong Kong

Amsterdam, Holland

**Organisers**  
Convention and Exhibition Administration, PO Box 259, Roseville, NSW 2069, Australia  
Industrial & Trade Fairs International, 021-705 6707  
Interface Group Inc, Amsteldijk 166, 1079 LH Amsterdam

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